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ENVIRONMENTAL ASSESSMENT BOARD

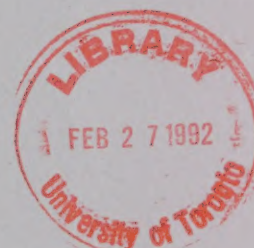
VOLUME: 352

DATE: Monday, February 17, 1992

BEFORE:

A. KOVEN Chairman

E. MARTEL Member



FOR HEARING UPDATES CALL (COLLECT CALLS ACCEPTED) (416)963-1249

FARR &
ASSOCIATES
REPORTING INC.

(416) 482-3277

2300 Yonge St., Suite 709, Toronto, Canada M4P 1E4

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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental
Assessment for Timber Management on Crown
Lands in Ontario;

- and -

IN THE MATTER of a Notice by The Honourable
Jim Bradley, Minister of the Environment,
requiring the Environmental Assessment
Board to hold a hearing with respect to a
Class Environmental Assessment (No.
NR-AA-30) of an undertaking by the Ministry
of Natural Resources for the activity of
Timber Management on Crown Lands in
Ontario.

Hearing held at the offices of the Ontario
Highway Transport Board, Britannica Building,
151 Bloor Street West, 10th Floor, Toronto,
Ontario, on Monday, February 17th, 1992,
commencing at 10:30 a.m.

Volume 352


BEFORE:

MRS. ANNE KOVEN
MR. ELIE MARTEL

Chairman
Member

A P P E A R A N C E S

MR. V. FREIDIN, Q.C.	)	MINISTRY OF NATURAL
MS. C. BLASTORAH	)	RESOURCES
MS. K. MURPHY)	
MR. B. CAMPBELL)	
MS. J. SEABORN	)	MINISTRY OF ENVIRONMENT
MS. N. GILLESPIE)	
MR. R. TUER, Q.C.	)	ONTARIO FOREST INDUSTRY
MR. R. COSMAN	)	ASSOCIATION and ONTARIO
MS. E. CRONK	)	LUMBER MANUFACTURERS'
MR. P.R. CASSIDY	)	ASSOCIATION
MR. D. HUNT)	
MR. R. BERAM		ENVIRONMENTAL ASSESSMENT BOARD
MR. J.E. HANNA	)	ONTARIO FEDERATION
DR. T. QUINNEY	)	OF ANGLERS & HUNTERS
MR. D. O'LEARY	)	and NORTHERN ONTARIO TOURIST OUTFITTERS ASSOCIATION
MR. D. HUNTER	)	NISHNAWBE-ASKI NATION
MR. M. BAEDER	)	and WINDIGO TRIBAL COUNCIL
MS. M. SWENARCHUK	)	FORESTS FOR TOMORROW
MR. R. LINDGREN)	
MR. D. COLBORNE	)	GRAND COUNCIL TREATY #3
MR. G. KAKEWAY)	
MR. J. IRWIN		ONTARIO METIS & ABORIGINAL ASSOCIATION
MS. M. HALL		KIMBERLY-CLARK OF CANADA LIMITED and SPRUCE FALLS POWER & PAPER COMPANY



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MR. P.D. McCUTCHEON .	GEORGE NIXON
MR. C. BRUNETTA	NORTHWESTERN ONTARIO TOURISM ASSOCIATION

I N D E X O F P R O C E E D I N G S

<u>Witness:</u>	<u>Page No.</u>
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I N D E X O F E X H I B I T S

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
2097	Written witness statement for Panel 7.	61232
2098	Errata re Panel 7.	61233
2099A	Interrogatory questions and answers thereto consisting of 32 pages.	61233
2099B	CV of Mr. Jeff Patch.	61236
2099C	Excerpt from the 52nd North American Wildlife and Natural Resources Conference.	61236
2099D	Excerpts taken from the North American Agency Review of Wildlife Habitat Management Strategies and various other excerpts.	61236
2100	CV of Dr. Thomas.	61237
2101	Document entitled Wildlife Habitats in Managed Forests, the Blue Mountains of Oregon and Washington dated September 1979.	61261
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2103A	Forest cover map	61315
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2103C	Working map	61317
2103D	Harvest schedule map	61319
2104	Hard copy of 14 overheads referred to by Dr. Page in his evidence-in-chief.	61364

1 ---Upon commencing at 10:30 a.m.

2 MADAM CHAIR: Good morning. Please be
3 seated.

4 Good morning, gentlemen.

5 Good morning, Mr. O'Leary.

6 MR. O'LEARY: Madam Chair. Perhaps I can
7 start by introducing the panel, Madam Chair, Mr.
8 Martel.

9 On my left is Mr. Jeff Patch who is from
10 New Brunswick; in the middle Jack Ward Thomas who is
11 from western United States as well as elsewhere; and to
12 his left is Dr. Rick Page who is from British Columbia
13 formally from Ontario.

14 Perhaps before we begin we could ask that
15 the witnesses be sworn or affirmed.

16 MADAM CHAIR: Yes, please.

17 JEFF PATCH,
18 JACK WARD THOMAS,
RICK PAGE; Sworn.

19 MR. O'LEARY: Perhaps, Madam Chair, we
20 could start by marking a few documents as exhibits.
21 The first would be the witness statement for Panel 7.

22 MADAM CHAIR: The written witness
23 statement for Panel 7 will be Exhibit 2097.

24 ---EXHIBIT NO. 2097: Written witness statement for
25 Panel 7.

1 MR. O'LEARY: There is an errata that
2 will be here in a matter of seconds and perhaps we can
3 mark that as the next exhibit.

4 MADAM CHAIR: The errata will be Exhibit
5 2098.

6 ---EXHIBIT NO. 2098: Errata re Panel 7.

7 MR. O'LEARY: The interrogatory responses
8 to the various questions asked by the parties to the
9 hearing, perhaps we can mark that as the next exhibit.

10 MADAM CHAIR: The interrogatories, and we
11 have 20 pages of interrogatory responses -- well, no.
12 Those are just MNR's interrogatories.

13 MR. O'LEARY: There are 32 pages.

14 MADAM CHAIR: Yes. The covering letter
15 is dated February the 3rd, 1992. These will become
16 Exhibit 2099.

17 ---EXHIBIT NO. 2099A: Interrogatory questions and
18 answers thereto consisting of
32 pages.

19 MR. O'LEARY: There are also several
20 attachments to that document. One of which was the
21 curriculum vitae of Mr. Jeff Patch and the other is a
22 document entitled Transactions for the 52nd North
23 American Wildlife and Natural Resources Conference.

24 There is also some excerpts from a report
25 from the Ministry of Natural Resources in respect of

1 one of their questions as well.

2 MADAM CHAIR: Mr. O'Leary, on the last
3 item you mentioned, what was that?

4 We have two attachments to the
5 interrogatory responses being the CV of...

6 MR. O'LEARY: Mr. Patch.

7 MADAM CHAIR: ...Mr. Patch and the
8 Transactions of the North American Wildlife Conference,
9 but we don't have the last item you were referring to.

10 MR. FREIDIN: Madam Chair, when those
11 particular copies of the attachments are provided to
12 you I would suggest perhaps -- I would ask Mr. O'Leary
13 whether he would agree that they be marked as separate
14 exhibit numbers.

15 We are going to be referring to them I
16 think during cross-examination and if they haven't got
17 a specific numbered page as part of Exhibit 2099 it is
18 going to get confusing.

19 MR. O'LEARY: That's fine if you want to
20 mark them separately.

21 MADAM CHAIR: Why don't we refer to Mr.
22 Patch's CV as Exhibit 2099 -- Exhibit 2099A will be the
23 interrogatory package consisting of 32 pages; Exhibit
24 2099B will be Mr. Patch's CV and Exhibit 2099C will be
25 an excerpt from the 52nd North American Wildlife and

1 Natural Resources Conference which appears to be an
2 article by Mr. Patch on habitat supply analysis and
3 forest management and it is six pages in length.

4 Exhibit 2099D will be the North American
5 Agency Review of Wildlife Habitat Management Strategies
6 which is described as An Appendix to Wildlife Habitat
7 Management Strategies, A Comparison of Approaches for
8 Integrating Habitat Management and Forest Management
9 prepared for the Ontario Ministry of Natural Resources
10 Wildlife Branch by Michael J. Rows of ESSA, Social
11 Assistance Analyst Limited, dated March the 18th, 1991.

12 Following that excerpt is -- oh, I see,
13 they are just various excerpts from the same report.
14 We won't give those separate numbers. All those will
15 comprise Exhibit 2099D.

16 MR. O'LEARY: Perhaps just for the record
17 I might identify that the second excerpt is the Habitat
18 Supply Analysis and Modelling State-of-the-Art and
19 Feasibility of Implementation in Ontario prepared for
20 the MNR by Messrs. Greig, Duinker, Wedeles and Higgelke
21 and it is also another ESSA excerpt and it is dated
22 June 14th, 1991 and it is --

23 MADAM CHAIR: It is in two different
24 places in that package.

25 MR. O'LEARY: We will just leave that

1 description.

2 ---EXHIBIT NO. 2099B: CV of Mr. Jeff Patch.

3 ---EXHIBIT NO. 2099C: Excerpt from the 52nd North
4 American Wildlife and Natural
Resources Conference.

5 ---EXHIBIT NO. 2099D: Excerpts taken from the North
6 American Agency Review of
7 Wildlife Habitat Management
Strategies and various other
excerpts.

8 MR. O'LEARY: I have one other filing at
9 this time and this is the complete and unabridged
10 version of Dr. Thomas' curriculum vitae and I would ask
11 that that be marked as an exhibit. It consists of
12 pages 7 through 130 of a document that he will identify
13 in a moment.

14 MADAM CHAIR: There are two copies of
15 this, Mr. O'Leary?

16 MR. O'LEARY: We just provided the Board
17 with two copies, but the package before you consists of
18 one document.

19 MR. MARTEL: Do you have any spare time
20 left or...

21 MADAM CHAIR: You have set a new record,
22 Dr. Thomas, for longest CV at the hearing. This is
23 your list of publications.

24 DR. THOMAS: Yes.

25 MADAM CHAIR: Thank you. That will be

1 Exhibit 2100.

2 ---EXHIBIT NO. 2100: CV of Dr. Thomas.

3 MR. FREIDIN: I am just wondering, Madam
4 Chair, could you advise what page numbers compose
5 Exhibit 2099D and E?

6 MR. O'LEARY: There is no E.

7 MADAM CHAIR: There is just Exhibit
8 2099D, Mr. Freidin.

9 MR. FREIDIN: Can you just indicate what
10 pages you have.

11 MADAM CHAIR: All together these excerpts
12 are 10 pages double sided.

13 MR. FREIDIN: The pages of the actual
14 tab, are they not noted at the bottom?

15 MADAM CHAIR: Yes.

16 MR. FREIDIN: I want to make sure that I
17 have got the same document that's been filed as an
18 exhibit.

19 MADAM CHAIR: All right. The cover page
20 is the title page that I read from, the March 18th
21 overview -- North American Agency Review of Wildlife
22 Habitat Management Strategies and that's pages 2, 3, 4
23 and 5. Well, actually the last three pages are not
24 dated, but they appear to be correspondence and
25 comments on the draft agency review document.

1 MR. FREIDIN: Madam Chair, I think I can
2 short circuit this. Mr. Hanna will give me a copy of
3 perhaps the package and if I have a problem with the
4 numbering I can raise it with Mr. O'Leary.

5 MADAM CHAIR: Thank you. When we start
6 discussing this we might put our own numbering on these
7 pages.

8 MR. FREIDIN: All right, thank you.

9 DIRECT EXAMINATION BY MR. O'LEARY:

10 Q. Perhaps I can start with you, Mr.
11 Patch. Would you please turn to Exhibit 2097 which is
12 the witness statement.

13 I would simply like to ask you whether or
14 not the question where you are indicated as the
15 respondent to the question, were the responses prepared
16 by you or under your direction and supervision?

17 MR. PATCH: A. All the responses in the
18 witness statement were prepared under my direction and
19 supervision.

20 Q. Thank you. The errata which is
21 Exhibit 2098, can I ask you whether or not that was
22 prepared by you or under your direction and
23 supervision?

24 A. It was prepared under my supervision.

25 Q. All right. In respect of the

1 interrogatory responses for which you were responsible,
2 can I ask you whether or not they were prepared by you
3 or under your direction and supervision?

4 A. They were prepared under my
5 supervision.

6 Q. All right. In respect of those terms
7 and conditions which are identified at page 7 of the
8 witness statement at question 9 and the rationale
9 that's contained in the terms and conditions of the
10 Coalition, can I ask you whether or not you adopt those
11 as your evidence in this hearing?

12 A. Yes, I adopt those.

13 Q. Do you adopt all of the -- do you
14 adopt the witness statement, the errata and the
15 interrogatory responses also as your evidence in this
16 hearing?

17 A. Yes, I do.

18 MR. O'LEARY: Madam Chair, just one other
19 housekeeping item. We have an updated exhibits
20 reviewed insertion for the witness statement which
21 perhaps should be filed at this point as well as the
22 transcripts reviewed by the witnesses as well.

23 As has been the practice in the past,
24 perhaps we can just insert those at the applicable tabs
25 in the witness statement.

1 MADAM CHAIR: Thank you, Mr. O'Leary.

2 MR. O'LEARY: Q. Dr. Page, can I ask you
3 to turn to the witness statement which is Exhibit 2097.

4 Can you tell me whether the responses
5 where you are indicated as the responding party, were
6 they prepared by you or under your direction and
7 supervision?

8 DR. PAGE: A. They were prepared under
9 my direction and supervision.

10 Q. Similarly, the errata, can you tell
11 me whether the changes to the witness statement as
12 identified in the errata, were they prepared by you or
13 under your direction and supervision?

14 A. Yes, they were prepared under my
15 direction and supervision.

16 Q. The interrogatory responses where you
17 are identified or for those questions for which you
18 were responsible, were the responses prepared by you or
19 under your direction and supervision.

20 A. The responses were prepared under my
21 direction and supervision.

22 Q. In respect of the terms and
23 conditions that are identified at page 7 of the witness
24 statement and paragraph 9 and the rationale that
25 appears opposite them in the terms and conditions which

1 is Exhibit 1697 in this matter, do you adopt that as
2 your evidence in this hearing?

3 A. Yes, I do.

4 Q. Do you adopt the witness statement,
5 the interrogatory responses and the errata also as your
6 evidence in this hearing?

7 A. Yes, sir, I do.

8 Q. Dr. Thomas, could I ask you to turn
9 to Exhibit 2097 which is the witness statement. Can I
10 ask you similarly, for those questions where you are
11 identified as the respondent, can you advise me whether
12 the responses were prepared by you or under your
13 direction and supervision?

14 DR. THOMAS: A. They were prepared by me
15 or under my supervision.

16 Q. All right. In respect of the errata
17 and changes to your responses, were those prepared by
18 you or under your direction and supervision?

19 A. They were prepared under my
20 supervision.

21 Q. All right. The responses to the
22 various interrogatories asked by the several parties
23 where the question is one for which you were
24 responsible, were the responses prepared by you or
25 under your direction and supervision?

1 A. They were prepared by me or under my
2 supervision.

3 Q. And you adopt these documents as your
4 evidence in this hearing?

5 A. I do.

6 Q. In respect of the terms and
7 conditions found at page 7 of Exhibit 2097 and the
8 rationale that appears opposite them in Exhibit 1697
9 which is the Coalition's terms and conditions, do you
10 also adopt those as your evidence in this hearing?

11 A. Yes.

12 Q. Thank you. Dr. Thomas, perhaps we
13 could start with you and Exhibit 2100 which is your
14 curriculum vitae. I note that the first page of that
15 exhibit starts at page 7. Can you perhaps tell me what
16 is this document?

17 A. We are required in the agency that I
18 work for, the United States Department of Agriculture
19 Forest Service in the Science Division, to go for peer
20 review about every four years.

21 Factors one, two and three are a
22 description of my position, the requirements of the
23 position, the qualifications necessary. Factor four is
24 routinely prepared and contains probably more than you
25 want to know, but essentially my professional

1 performance updated to that date. So that's why it is
2 factor four.

3 Q. Do you have an approximate date of
4 when this document was prepared?

5 A. It was approximately a year ago, nine
6 months ago.

7 Q. All right. Was it prepared by you or
8 under your direction and supervision?

9 A. Yes, it was prepared by me.

10 Q. Thank you. Perhaps we could briefly
11 go through it, but before I start there I would like to
12 indicate to the Board that, once again, the list of
13 issues did not indicate that any of the parties have
14 any concerns about the qualifications of these
15 witnesses to give expert opinion evidence in the areas
16 identified on page 5, and unless there is any
17 indication to the contrary it is my intended purpose to
18 simply briefly go through the several curriculum vitae
19 and the qualifications of these gentlemen.

20 MADAM CHAIR: Are there any objections
21 from the parties?

22 (No response)

23 Go ahead, Mr. O'Leary.

24 MR. O'LEARY: Thank you, Madam Chair.

25 Q. Starting with page 7, Dr. Thomas, I

1 understand that you received a Bachelor of Science
2 Degree from the Texas University in 1957 in wildlife
3 management; is that correct?

4 DR. THOMAS: A. That's correct.

5 Q. And you received a Masters in
6 Wildlife Science from the University of West Virginia
7 in 1969?

8 A. That's correct.

9 Q. Thank you. Would these -- and I
10 understand that these degrees would entitle you to be
11 certified as a wildlife biologist in the United States?

12 A. That's correct.

13 Q. And then in 1974 from the University
14 of Massachusetts you received a doctoral degree in
15 forestry?

16 A. That's correct.

17 Q. Thank you. Moving down the page, I
18 see under the heading Professional Experience that you
19 were employed with the Texas Game and Fish Commission
20 commencing in 1957 lasting up until, it appears,
21 November, 1966.

22 Can you tell us a little more about your
23 duties and responsibilities in that position?

24 A. Yes. In 1957 we were beginning
25 essentially to enhance the wildlife biologist talent

1 within the Texas Game and Fish Commission which it
2 later became the Texas Parks and Wildlife Department.
3 I was privileged to be in on the ground floor of the
4 establishment of technical game management operations
5 in that state.

6 I worked in the Edwards Plateau which is
7 the most densely populated area of the United States in
8 terms of ungulates, white-tailed deer in this case. I
9 worked for 10 years in the establishment and the
10 operation of large scale wildlife management on private
11 land.

12 So I have some 10 years of intense
13 on-the-ground management experience with a state
14 agency. The counterpart of province here.

15 Q. Do I understand then in December,
16 1966, you accepted a position with the U.S. Forestry
17 Service as a research wildlife biologist; is that
18 correct?

19 A. That's correct.

20 Q. And you remain employed with the U.S.
21 Forestry Service to this date?

22 A. I do.

23 Q. Can you tell me what your present
24 position is with them?

25 A. Presently I am the Chief Research

1 Wildlife Biologist for the U.S. Forest Service. My
2 station is at La Grande, Oregon.

3 I supervise there a research team of
4 approximately 12 individuals including assigned
5 personnel from the Oregon Department of Fish and
6 Wildlife and I am largely engaged at the moment in
7 large scale ungulate interaction research; deer, elk,
8 cattle.

9 Q. Thank you. Now, Dr. Thomas, at page
10 5 of the witness statement it is indicated that you
11 would ask the Board to qualify you to give expert
12 opinion evidence in respect of four areas and they are
13 wildlife habitat management research, integration of
14 wildlife and timber management, habitat supply analysis
15 modelling and resource management planning.

16 I would ask you if we briefly peruse your
17 curriculum vitae if you could identify those areas
18 where you feel your involvement in those areas might be
19 of assistance to the Board --

20 A. What page was that in the witness
21 statement?

22 Q. The witness statement, page 5.

23 A. All right.

24 Q. If you could just briefly highlight
25 as we go through your CV those areas where you feel

1 they might be of help to the Board in understanding
2 your qualifications in those four areas.

3 Before we begin, perhaps I could ask you,
4 in your position as Chief Research Biologist, can you
5 tell me, is there any significance to the title Chief?

6 A. That title indicates that that's the
7 highest possible grade within the research organization
8 for which I work. There are probably -- I'm not
9 certain, but I would assume about 500 research
10 scientists, two of which are at that grade.

11 Q. I understand there is some sort of a
12 ranking system within the American government with
13 respect to scientists; is that correct?

14 A. That's correct.

15 Q. And can you describe for me and
16 advise the Board where you --

17 A. Very quickly. If you put it on an
18 American scale our several service grades run from
19 grade 1 to grade 16. Actually, scientists run from
20 grade 12 to grade 16 and I am grade 16; one of two or
21 three in the forest service.

22 Q. With 16 being the highest?

23 A. Yes.

24 Q. Thank you. Moving to the heading
25 under paragraph B which is Professional Activities and

1 Recognition which is at page 8 of your CV, can you
2 perhaps indicate to us what areas are of significance
3 for the purpose of the Board understanding your
4 qualifications to give expert evidence, Dr. Thomas?

5 A. There are a number of those. One, we
6 have several awards that can be given internal to the
7 American civil service. Two of those I have received,
8 the two highest awards, and I will locate it here.

9 Q. Page 11.

10 A. Page 11. Item 32, the Superior
11 Service Award is the highest award that we can attain
12 and the citation for that award is for outstanding
13 contribution to the integration of wildlife and forest
14 management which has essentially been my specialty in
15 research and in technology transfer for the past 10
16 years.

17 Q. All right. By whom is that award
18 given?

19 A. It's given at the department level.
20 This would be the United States Department of
21 Agriculture.

22 Q. All right. I also see in item 36
23 that you received the USDA award for superior service,
24 Oregon Range Evaluation Group. Can you tell us a
25 little more about that?

1 A. Yes. I work in both forestry --
2 wildlife and forestry areas and in range wildlife
3 areas. I headed up a team that developed a
4 considerable amount of information for utilization in
5 dealing with range management wildlife issues and we
6 received a Superior Service Award as a group for that
7 activity.

8 The citation was for outstanding
9 leadership and cooperative spirit providing new
10 technology and information to efficiently and
11 economically manage range lands. My particular
12 contribution on the team was to work in the wildlife
13 aspects of range management.

14 Q. Dr. Thomas, for those of us that are
15 unfamiliar with the various awards that are given out
16 in the United States, can you equate these awards to
17 any -- can you provide any analogies that you might be
18 able to relate these to either in Canada or on a
19 military scale?

20 A. If they were on a military scale in
21 the United States they would be what we would call the
22 distinguished service cross. That's not for heroism.
23 That's for --

24 Q. Are there black bears in the United
25 States?

1 A. Well, on the other hand it might be
2 too.

3 Q. Dr. Thomas, can I ask you, is there
4 any significance to the fact that you received both the
5 Superior Service Award and the award for -- well, the
6 award twice.

7 A. Only to the extent that it's very
8 rare first to receive the award. It is certainly even
9 more rare to receive it twice.

10 Q. Dr. Thomas, can you tell me, has
11 there been any recognition by your peers within the
12 United States?

13 A. Yes. It was my great honour at last
14 year's North American Wildlife Conference to receive
15 the Aldo Leopold medal for distinguished service for
16 wildlife conservation.

17 The professional society, International
18 Society for Wildlife Biologists is a wildlife society
19 and that is the highest awarded in the profession.

20 Also, within the last year I received the
21 outstanding achievement award from the Society for
22 Conservation Biology. I received the National Wildlife
23 Federation award for contributions to science.

24 MR. O'LEARY: The references are on page
25 12, Madam Chair.

1 Q. In respect of forestry, has there
2 been any recognition by your peers?

3 DR. THOMAS: A. Yes. The professional
4 society in the United States for foresters is the
5 Society of American Foresters. The highest rate of
6 membership in that society is Fellow to which one is
7 elected by their peers. I am a Fellow of the SAF.

8 MR. O'LEARY: That reference, Madam
9 Chair, is found at page 11, item 31.

10 Q. That was in 1985, Dr. Thomas?

11 DR. THOMAS: A. That's correct.

12 Q. Turning to page 13 of your CV under
13 the heading -- the major heading is Presentations and
14 you have broken that down into, first of all, the
15 subheading of Technical Presentations.

16 Can you tell us, what are you referring
17 to by the term 'technical presentations'?

18 A. Yes. In this regard technical
19 presentations are those presentations -- they could be
20 to professional societies, to symposiums and meetings,
21 but that they involve the presentation of technical
22 information in a technical fashion.

23 Q. All right. You also indicate Invited
24 Presentations. What is the significance of that?

25 A. These are presentations for which

1 there was an invitation to make the presentation as
2 opposed to the submission of a presentation for
3 consideration for a meeting.

4 Most of those also entail the fact that
5 the person that invited the presentation also paid for
6 costs associated with per diem expenses.

7 Q. Okay. Your CV indicates 196
8 technical presentations, and if I was to ask you to go
9 through that I would have to seek leave from the Board
10 to extend the hearing, but perhaps you could briefly
11 summarize those areas where you have made technical
12 presentations which you feel would be of assistance to
13 the Board in helping them understand your
14 qualifications to give evidence in relation to this
15 hearing?

16 A. They run across the board and, of
17 course, run back 35 years, but essentially on persual I
18 think that the Board would see that a large number of
19 those presentations over the past 10 years have been
20 associated with integration of wildlife and timber
21 management or wildlife and range management and
22 essentially what you call habitat supply analysis. We
23 have other terminology but it means the same thing.

24 Q. All right.

25 A. That's been probably one of my

1 several primary thrust over the past 10 years.

2 Q. Thank you. Then moving to page 33 of
3 your CV, Dr. Thomas, under the heading Non-technical
4 Presentation, you indicate that you have participated
5 in 229 of those.

6 Can you, first of all, advise us as to
7 what you mean by non-technical presentations?

8 A. These are essentially presentations,
9 albeit it may be technical information, but
10 presentation to lay groups, to the public, to those
11 people who are not trained professionals in natural
12 resource management.

13 It's what we also would call in the
14 United States attempts at technical technology
15 transfer; the transfer of very technical information to
16 user groups, to the public, to interested citizens.

17 It's obvious this is not something that's
18 necessarily required even though we do receive reward
19 for it. It is a particular philosophical point of mind
20 that I don't feel that the job is done until I have
21 made an attempt to try to transfer that technical
22 information into use and to try to ensure that people
23 that are interested have an ability to understand
24 what's going on.

25 Q. All right. You indicate these are

1 all invited presentations. Does that similarly mean
2 that these lay groups or associations are inviting you
3 to make these presentations?

4 A. Correct.

5 Q. Thank you. Moving on now to page 55,
6 Dr. Thomas, under the subheading Academic Lectures, you
7 have listed 62. Perhaps you could advise the Board as
8 to the significance of these lectures?

9 A. I hold what we call in the United
10 States adjunct appointments at several major
11 universities.

12 My primary reason for doing that is,
13 again, the aspects of technology transfer to try to
14 build a feedback loop into the universities as to how
15 students might be appropriately trained to be very
16 useful in land management activities and in management
17 agencies.

18 The other aspect of it is it is dues one
19 pays. I like to do it, but it is dues one pays for
20 those adjunct appointments which I do hold because it
21 is necessary in my job to be most efficient to be able
22 to handle graduate students.

23 Q. Thank you. Can you give us some idea
24 of the extent of communications you would have with
25 graduate students in your position as adjunct professor

1 during these academic lectures?

2 A. I provide field experience for those
3 graduate students and employment. I have probably
4 contracted for as at least \$2 1/2-million worth of
5 graduate student research within my career.

6 For selected graduate students that we
7 have particular interest in, I will either supervise
8 their dissertation or MS work or serve on their
9 committees.

10 Q. Are you familiar with the nature and
11 training of these graduate students as a result of
12 this?

13 A. Yes, I am.

14 Q. Thank you. I see commencing on page
15 61 of your CV that you indicate you are a member of the
16 Society of American Foresters, on page 62 a member of
17 the Wildlife Society and there are a number of other
18 societies of which you indicate you are a member; is
19 that correct?

20 A. That's correct. I have served as
21 President of several, including the Wildlife Society
22 which I am most proud.

23 Q. Now, at page 69 of the CV you
24 indicate you have been involved in a number of special
25 assignments. Perhaps you could identify those areas of

1 significance under that heading, Dr. Thomas?

2 A. Yes. The one I think most germane to
3 this particular hearing, I did receive an assignment to
4 put together our first attempt at being able to deal
5 with the entire cross-section of vertebrate species of
6 wildlife in the Blue Mountains of Oregon and Washington
7 in terms of forest planning and management.

8 From that assignment grew the U.S.
9 Department of Agriculture Forest Service Program on
10 what we call wildlife habitat relationships which was
11 an attempt to provide that technology and upgrade that
12 technology for habitat supply analysis and impact
13 analysis across the United States. That has since
14 spread into Canada. I have been to a number of places
15 in Canada as part of that special assignment.

16 There are other foreign countries, in
17 Germany, in India and also elsewhere where this
18 technology is being used.

19 Most recently, my two most recent special
20 assignments was that I headed the team of 17
21 specialists that prepared the conservation strategy for
22 the northern spotted owl which is now being severely
23 debated internal to the United States.

24 Immediately after that I was one of four
25 people chosen by an appropriate committee in the

1 American Congress to prepare a number of alternatives,
2 to prepare and evaluate a number of management
3 alternatives for old growth forest in the Pacific
4 Northwest.

5 Q. To whom did you give that
6 presentation?

7 A. That presentation was presented to
8 the -- was prepared for and initially presented to the
9 subcommittee -- the committee on agriculture of the
10 U.S. House of Representatives.

11 It has been presented now a number of
12 other places to professional groups, to industry and
13 others.

14 Q. Thank you. Turning to page 89, Dr.
15 Thomas, under the heading Reporting Research Results
16 you have indicated under the subheading of Publications
17 that you have been involved in the preparation of 258
18 publications.

19 Again, is it possible for you to briefly
20 identify or generally indicate the nature of your
21 involvement in some of the projects that would be of
22 relevance to the Board in this hearing?

23 A. Very quickly. These things have
24 obviously changed over time as I have changed jobs, but
25 the first publications had to do the integration

1 development of wildlife habitat programs, both with
2 production of wildlife and the harvesting thereof and
3 the necessary research to back that up when I worked in
4 Texas.

5 When I moved to work for the Forest
6 Service in West Virginia, I was initially involved in
7 the research having to do with wildlife and recreation
8 user response to clearcutting on the Monogahela
9 National Forest.

10 Without elaboration, that particular
11 issue on the Monogahela National Forest led to the
12 explosion in the United States of reconstruction of the
13 mandates that govern Forest Service activities led to
14 the National Forest Management Act. I was not
15 responsible for that, but was sitting in the middle of
16 it when it occurred. So I did gain some experience
17 from it.

18 When I worked for the Forest Service in
19 Massachusetts we were largely involved with urban
20 forestry and wildlife. The first such unit in North
21 American.

22 Since the time I have been in La Grande,
23 Oregon my research has primarily dealt with the
24 responses of particular wildlife to forest habitats and
25 their manipulation, and then the technology transfer

1 and development aspects was to develop the ability to
2 do wildlife assessment analyses across 379 vertebrate
3 species in a similar operation for range management.

4 Again, it has led to a number of
5 assignments as I have become more experienced to deal
6 with the synthesis of information. In other words, in
7 stead of original research to deal with the entire body
8 of information that's available to bring it into a
9 synthesized form that can be put to work in management.

10 Q. Thank you, Dr. Thomas. Can I ask you
11 now to turn to page 117 and you have under the
12 subheading Others listed videotapes and you have
13 identified 12 of them.

14 Can I first ask you whether you were
15 involved -- whether you were personally involved in the
16 preparation of those videotapes?

17 A. Yes.

18 Q. All right. Can you tell me, why were
19 these videotapes prepared, what purpose?

20 A. We had -- I don't know if it has been
21 submitted into evidence yet, I assume it will be, the
22 book that's laying on the table there, Wildlife
23 Habitats in Managed Forests, the Blue Mountains of
24 Oregon and Washington which was essentially a
25 publication on what we call our wildlife habitat

1 relationships program.

2 That was the training manual that we
3 essentially used to brief foresters, wildlife
4 biologists across North American on this particular
5 technique.

6 There was a -- it was soon obvious that I
7 could not take care of all the training assignments
8 that people wished to hear. So at one of these
9 training assignments at the University of Idaho where
10 they have a very first class video centre they
11 essentially taped those presentations and then edited
12 them into final form. So they have been used in
13 training sessions across the United States, Canada,
14 Europe.

15 Q. All right. Dr. Thomas, you made
16 reference to a document entitled Wildlife Habitats in
17 Managed Forests, the Blue Mountains of Oregon and
18 Washington and it indicates that you are technical
19 editor of this document dated September, 1979?

20 A. That's correct.

21 MR. O'LEARY: Madam Chair, perhaps we
22 could mark that as the next exhibit.

23 MADAM CHAIR: This document will become
24 Exhibit 2101. Was there a date on that, Mr. O'Leary?

25 MR. O'LEARY: The third page in. I

1 believe I said September '79.

2 MADAM CHAIR: The date on the cover,
3 September '79.

4 ---EXHIBIT NO. 2101: Document entitled Wildlife
5 Habitats in Managed Forests, the
6 Blue Mountains of Oregon and
Washington dated September 1979.

7 MR. O'LEARY: Q. Is the Board to
8 understand, Dr. Thomas, that some of those videotapes
9 relate directly to the book we just entered as an
10 exhibit in this hearing?

11 DR. THOMAS: A. Yes.

12 Q. Which tapes are those? Can you
13 specifically identify those?

14 A. Please give me the reference on the
15 page number again, please.

16 Q. 117.

17 A. 117, all right. Items 1 through 8.

18 Q. Thank you. I understand that you
19 have made or will be making a request for copies of
20 these videotapes to be, if possible, brought to Canada?

21 A. I will put in a phone call at the
22 break and see if I can get those for you.

23 Q. Thank you, Dr. Thomas.

24 MR. FREIDIN: Are you intending to file
25 them?

1 MR. O'LEARY: Well, I guess I should. If
2 it is possible to have them brought up to Canada it is
3 our intention to have them marked as exhibits, yes.

4 MR. FREIDIN: Are we going to see them as
5 part of the evidence?

6 MR. O'LEARY: We certainly hope so.

7 MR. FREIDIN: You are going to take the
8 time to show these videotapes?

9 MR. O'LEARY: You can see if you go
10 through it, Mr. Freidin, Madam Chair, they do run on to
11 some length. You know, the first three of them alone
12 add up to 155 minutes. It would take the entire time
13 allotted for the evidence-in-chief to go through it.

14 Much of it is contained in the exhibit
15 which was just marked and that's why I asked the
16 question of Dr. Thomas as to whether or not there is
17 any relation between the tapes and the book.

18 So, Mr. Freidin, you are at liberty to
19 review the exhibit and that I believe, correct me if I
20 am wrong, Dr. Thomas, that will be more or less the
21 gist of what's contained in the videotapes.

22 DR. THOMAS: In essence there is nothing
23 in the videotapes that is not in that book. It's an
24 oral presentation with more visual aids, but
25 essentially they're precisely the same information.

1 MR. O'LEARY: Madam Chair, we thought it
2 might be helpful to have the tapes here because to the
3 extent they do have those additional visual aids they
4 may be of assistance in helping understand some of the
5 evidence of Dr. Thomas.

6 Q. At page 124, Dr. Thomas, under the
7 heading Cooperative Aid Agreements you have identified
8 52 projects. Can you, first of all, elaborate on what
9 these refer to and indicate those projects of relevance
10 to this hearing?

11 A. Essentially each one of those is a
12 contract negotiated under my direction at either a
13 college or university or a particular research study.

14 Those that would have particular interest
15 here would be items 14, 15, 16, 18, 19, 20, 21, 22, 29,
16 30, 32, 33, 35, 37, 38, 39, 41, 46, 48. Those
17 essentially would be those that might have -- would not
18 be directly applicable within Ontario, but address the
19 kind of questions on multiple use outputs from forests
20 that one would anticipate anywhere.

21 Q. And am I understand that you were
22 dealing with these graduate students on a hands-on
23 basis?

24 A. Some of those contracts were not
25 necessarily with graduate students. Some of them are

1 with professors. Some of them I personally directed,
2 others were directed by members of my staff or the
3 contract was left to very well qualified academics that
4 conducted the research.

5 I had very little to do with some of them
6 outside of dealing with the initial contracting and the
7 initial preparation of the study plans.

8 Q. Thank you.

9 MR. O'LEARY: Just for the Board's
10 assistance, towards the end of the CV at pages 127 and
11 128 Dr. Thomas has summarized numerically the
12 substantial extent to which he has been honoured and
13 received awards and has been involved in academic
14 matters and practical matters. They are all summarized
15 in terms of number form there as well.

16 Madam Chair, I would respectfully submit
17 that Dr. Thomas is qualified to give expert opinion
18 evidence in the areas identified at page 5 of the
19 witness statement.

20 MADAM CHAIR: Any objections?

21 (no response)

22 Dr. Thomas will be so qualified to give
23 expert evidence in wildlife habitat management and
24 research, integration of wildlife and timber
25 management, habitat supply analysis modelling and

1 resource management planning.

2 MR. O'LEARY: Thank you.

3 Q. Dr. Page, if I could turn to you
4 next. I would ask you to turn to the curriculum vitae
5 which is attached to Exhibit 2097 under Tab 11 of the
6 witness statement. Do you have a copy there.

7 DR. PAGE: A. Yes, I do.

8 Q. Thank you. Can you tell me, where
9 you were born?

10 A. I was born in St. Catharines,
11 Ontario.

12 Q. How long did you reside in Ontario?

13 A. I grew up through all my younger
14 years, did my initial education in Ontario and my
15 initial employment with the Ontario Ministry of Natural
16 Resources.

17 Q. All right. Beginning with the
18 heading Education on page 1 of your curriculum vitae, I
19 understand you received your Bachelor of Science in
20 Zoology at the University of Guelph?

21 A. Yes, I did.

22 Q. You were also -- well, you received
23 your Masters from the University of Victoria in biology
24 in 1985?

25 A. That's correct.

1 Q. It indicates in 1980 you were a
2 visiting student at the University of British Columbia.
3 What does that relate to?

4 A. The University of British Columbia is
5 a particularly viable centre of information on
6 modelling and natural resource management, and I felt
7 given that I was fairly close in Victoria I had an
8 opportunity to learn things at that university that I
9 couldn't learn anywhere else. So I made arrangements
10 to appear as a visiting student there for one year.

11 Q. All right. I understand you received
12 a Doctoral Degree in Forestry from the Michigan
13 Technical University in 1989?

14 A. That's correct.

15 Q. All right. And can you tell us a
16 little bit about your thesis in respect of that degree?

17 A. The focus of the research in that
18 particular case was continuing the studies on Isle
19 Royale National Park which is in Lake Superior close to
20 the Canadian border. That island itself is primarily
21 boreal forest. It has been the focus of continuing
22 research since the 1920s on the dynamics of boreal
23 forest ecosystems.

24 My particular study was the most recent
25 10-year study of moose and wolves. The study has now

1 been ongoing for 38 years. The initial doctoral
2 research on that island on moose and wolves was
3 conducted by Dr. David Meech. The second doctoral
4 research program was by Dr. Ralph Peterson who became
5 my supervisor in my doctoral research spanning the
6 better part of the decade of the 1980s.

7 Q. Thank you. Now, Dr. Page, you have
8 indicated at page 5 of the witness statement that you
9 would ask the Board to qualify you to give expert
10 opinion evidence in respect of wildlife habitat
11 management and research, the integration of wildlife
12 and timber management and habitat supply analysis
13 modelling.

14 Perhaps when we now turn to page 2 of
15 your curriculum vitae under the heading Experience you
16 can tell us a little more about your position with the
17 Research Branch of the Ministry of Forests in British
18 Columbia from 1982 to the present to indicate to the
19 Board why you should be qualified in those several
20 areas?

21 A. When I was first retained by the
22 British Columbia government in 1982 I was brought on to
23 conduct original research into caribou habitat and the
24 impacts of forestry on caribou which followed from my
25 Masters research. Also, to advise other studies in a

1 broad array of wildlife species and issues dealing with
2 forestry and wildlife.

3 Because of my particular abilities and
4 skills I was subsequently asked to help the ministry
5 evaluate new technologies, particular in the use of
6 scientific research and studies in integrated forestry
7 and wildlife management problems and issues.

8 In the last roughly five years a major
9 focus of that effort has been in the development and
10 use of modelling using geographic information systems
11 or GIS, development of population and habitat models
12 and extention and demonstration of that information to
13 the other agencies, our own agency and the forest
14 companies and the public.

15 Q. Thank you. I see that you have
16 indicated that you lived in Ontario for a good portion
17 of your life. Was there any particular reason for your
18 move to British Columbia?

19 A. At the time I had been employed by
20 the Ontario Ministry of Natural Resources as a salaried
21 employer and was interested in conducting some doctoral
22 research on caribou -- I should say Masters level
23 research on caribou and I found that the climate for
24 innovative research was much more conducive in British
25 Columbia than the climate that I was attempting to work

1 under in Ontario. The funding level was greater and
2 the interest was substantially greater at the time.

3 Q. All right. Can you tell me, Dr.
4 Page, on whose behalf you appear here today as a
5 witness?

6 A. I appear only representing myself and
7 my personal beliefs and understandings. I don't
8 represent my agency.

9 Q. Thank you. Turning to page 3 of your
10 curriculum vitae, Dr. Page, under the subheading
11 Journal Pages -- sorry, Journal Papers, are there any
12 particular papers which would be of assistance to the
13 Board in understanding your qualifications to give
14 expert opinion evidence in relation to the matters
15 before the Board in this hearing?

16 A. The fifth paper, Page 1987,
17 Integration of Moose Population Dynamics for
18 Management - A Review and Synthesis of Modelling
19 Approaches in North America is the publication of a
20 presentation I made to the international moose
21 symposium held in Upsala, Sweden in 1974.

22 That was an invited review that attempted
23 to take the information available throughout the world
24 on modelling and knowledge about population dynamics
25 and habitat management and to put it into some sort of

1 cohesive framework that can utilized by the managers
2 that were also attending that symposium.

3 On page No. 4, just an an example, in
4 1987, the fourth paper down on page 4, McNay, Page and
5 Camel 1987, Application of Expert-Based Decision Models
6 to Promote Integrated Management of Forests and Deer,
7 that paper represents an initiative that we undertook
8 in 1985 to attempt to provide some quantitative basis
9 in the integration of timber and management and to use
10 the current technology that was developing in terms of
11 expert systems and geographic information systems to
12 provide some more simplified methods for managers to
13 utilize.

14 Q. Thank you. I understand, Dr. Page,
15 that you are a member of the Association of
16 Professional Biologists in British Columbia and you are
17 also a member of the Wildlife Society and the
18 Federation of Ontario Naturalists; is that correct?

19 A. I have been a member of the
20 Federation of Ontario Naturalists since the early 70s.

21 MR. O'LEARY: Madam Chair, I would
22 respectfully submit that Dr. Page is qualified to give
23 expert evidence in the areas indicated in the witness
24 statement.

25 MADAM CHAIR: Any objections?

1 (no response)

2 Dr. Page will be qualified to give expert
3 evidence in wildlife habitat management research,
4 integration of wildlife and timber management and
5 habitat supply analysis modelling.

6 MR. O'LEARY: Q. Dr. Thomas, if I could
7 just briefly come back to you again, I would like to
8 also ask you the same question that I asked Dr. Page
9 and that is, in what capacity are you appearing here as
10 a witness.

11 DR. THOMAS: A. I appear here with the
12 permission of my employer, but it should be very clear
13 that I do not represent the United States government
14 nor the U.S. Forest Service. My opinions are strictly
15 my own.

16 Q. Thank you. Perhaps I could begin,
17 Mr. Patch, with asking you that question as well. On
18 whose behalf are you appearing here as a witness?

19 MR. PATCH: A. I'm appearing on my own
20 behalf.

21 Q. All right. If I could ask you to
22 turn to your curriculum vitae which is one of the
23 documents which is attached to the interrogatory
24 responses and has been marked as Exhibit 2099B, after
25 page 32 of the interrogatory response. Do you have

1 that?

2 A. Yes, I have the CV here.

3 Q. Perhaps we could start with your
4 educational qualifications which appear on page 4 of
5 your CV. It indicates you received a Bachelor of
6 Science from the University of New Brunswick in 1980
7 indicating Department of Forest Resources.

8 Can you tell us specifically what is the
9 degree you obtained at that time?

10 A. I obtained a degree of Bachelor of
11 Science in Forestry and I majored in wildlife
12 management and that degree gave me the educational
13 background to meet criteria to be certified as a
14 wildlife biologist and to become a registered
15 professional forester.

16 Q. Further down the page under the
17 subheading Specialization, you indicate forest
18 wildlife. Can you elaborate a little more on the
19 significance of that entry in your curriculum vitae?

20 A. A major element of my course work was
21 not only to meet the requirements to become a
22 professional forester, but also to become a
23 professional wildlife biologist.

24 So in undertaking that undergraduate
25 degree there was major course work in wildlife

1 sciences.

2 Q. All right. Going back to the first
3 page, Mr. Patch, of your curriculum vitae under
4 Experience, perhaps you could elaborate a little more
5 on your duties and responsibilities as regional
6 resource manager which I understand has been your
7 position commencing September 1990 through to the
8 present?

9 Perhaps you could highlight your duties
10 and responsibilities in light of the three areas in
11 which you asked the Board to qualify you which are,
12 again, wildlife habitat management and research,
13 integration of wildlife and timber management and
14 habitat supply analysis modelling.

15 A. Administratively, the New Brunswick
16 Department of Natural Resources and Energy is divided
17 into five resource regions and I am the senior
18 Executive Officer responsible for administration of all
19 the natural resources management activities in that
20 resource region.

21 This includes the timber and wildlife
22 management integration activities and wildlife habitat
23 management and habitat supply analysis modelling is a
24 requirement in New Brunswick in application of timber
25 management plans and in our system the industry is

1 required to submit in accordance with the forest
2 management agreements forest management plans that we
3 develop the standards for. They submit those plans to
4 the regional resource manager and I have the signing
5 authority to approve those plans.

6 Q. Thank you. The next position you
7 identify in your curriculum vitae is as the Director of
8 Wildlife Management with the Fish and Wildlife Branch,
9 New Brunswick Department of Natural resources and
10 Energy. You held that position, it appears, from July
11 1987 to August 1990?

12 A. Yes.

13 Q. Can you tell us a little more about
14 that position and how it relates to the three areas in
15 which you would ask the Board to qualify you to give
16 expert opinion evidence?

17 A. As Director of wildlife management in
18 the province I was responsible for the policy and
19 direction of all wildlife programs including the
20 support and administration of wildlife habitat
21 management and research programs and habitat supply
22 analysis programs that we had underway.

23 Q. Turning to page 2, you indicate that
24 from August 1982 to July 1987 you were the forest
25 habitat project leader, again, with the New Brunswick

1 Department of Natural Resources and Energy and I would
2 ask you to elaborate again in respect of three areas
3 you have been asked to be qualified here in this
4 hearing about your duties and responsibilities in that
5 position?

6 A. I was hired in 1982 to develop a
7 forest habitat management program in New Brunswick and
8 those are my duties during the term.

9 I was the project leader biologist
10 responsible for developing habitat supply analysis
11 procedures and a methodology for integrating timber and
12 wildlife management.

13 Q. From May 1980 through to August 1982
14 you were a forester in forest management planning,
15 Timber Management Branch, again, with the New Brunswick
16 Department of Natural Resources and Energy.

17 Can you advise us briefly of your duties
18 and responsibilities in that position and how it
19 relates to your request to be qualified as an expert in
20 this hearing?

21 A. I was initially hired in 1980 when
22 New Brunswick recognized a need to upgrade their forest
23 inventory and I was hired to assist in development of
24 the forest inventory, and also to use the forest
25 inventory data to be applied in timber supply analysis

1 procedures.

2 So I was involved in the development of
3 forecasting allowable cut and defining the required
4 silvicultural rates on all Crown timber licences in New
5 Brunswick during that period.

6 So my experience there was in forest
7 growth modelling which has an application in habitat
8 supply analysis modelling. It was during that period
9 that I wrote a proposal to broaden our forest growth
10 modelling procedures to corporate habitat supply
11 analysis.

12 Q. And I understand that at some point
13 during your position then you had an opportunity to
14 work with or for Dean Baskerville?

15 A. As an undergraduate at the University
16 of New Brunswick I had worked on a special project
17 involving forest growth modelling. Dr. Baskerville was
18 aware of that and he recommended through the New
19 Brunswick government that I be employed to assist in
20 development of their inventory in their wood supply
21 modelling program.

22 At that point his recommendation carried
23 a lot of weight because he moved over to be the
24 Assistant Deputy Minister of Forest Resouces in New
25 Brunswick for the same period.

1 During that time I worked with him under
2 his direction in the application of the forest growth
3 modelling procedures to define the boundaries of Crown
4 timber licences established in 1982 and to determine
5 the allowable cut levels and the silviculture rates on
6 all the Crown timber licences.

7 Q. Okay, Mr. Patch. Can I ask you to
8 turn to the last page of your CV. Under the heading
9 Published Papers, are there one or several that you
10 wish to identify for the purpose of helping the Board
11 understand your qualifications to give expert opinion
12 evidence here in this hearing?

13 A. Well, I think in particular the one
14 that was entered into evidence from the North American
15 Wildlife and Natural Sources Conference is a summary of
16 the applications and directions we were heading with
17 respect to habitat supply analysis procedures in New
18 Brunswick.

19 Q. All right. Under Professional
20 Affiliations, I understand that you are a member of the
21 Association of Registered Professional Foresters in New
22 Brunswick?

23 A. Yes, I am and I served a two-year
24 stint on the education committee whose mandate was to
25 review the educational requirements of foresters and

1 define the criteria for which they would be eligible
2 for registration.

3 Q. I also understand you have been
4 certified as an Association of the Wildlife
5 Biologists -- the Wildlife Society in Washington, D.C.?

6 A. That's correct.

7 Q. While it is not contained in your
8 curriculum vitae, Mr. Patch, I understand that you also
9 participated in a number of conferences.

10 I was wondering if there was one or
11 several that you would like to identify which might be
12 of assistance to the Board in understanding your
13 qualifications to give expert opinion evidence in this
14 hearing?

15 A. I have been asked to go to several
16 meetings and give different presentations on what we
17 are doing in New Brunswick and our procedures.

18 A key one would be the federal/provincial
19 wildlife conference held in Newfoundland several years
20 ago.

21 I have also been asked to sit on certain
22 technical committees. Currently I am on the Forestry
23 Canada technical subcommittee whose mandate is to
24 advise Forestry Canada on the merit of different model
25 forest proposals under the green plan. So I am one of

1 nine people selected to give their technical advice on
2 the merit of proposals for that \$54-million program.

3 Q. I also understand you were invited by
4 Forestry Canada to a conference to give a seminar in
5 Ottawa?

6 A. Yes. I was invited there along with
7 Wildlife Habitat Canada who have been partners with us
8 in funding our program and in support of it to brief
9 Forestry Canada senior management on our efforts.

10 Q. All right. I also understand that
11 you have been invited by the University Toronto School
12 of Forestry at some point to lecture on a particular
13 topic?

14 A. Yes, I was invited there as a guest
15 lecturer to outline the current state-of-the-art in New
16 Brunswick.

17 Q. All right.

18 MR. O'LEARY: Madam Chair, I would
19 respectfully submit that Mr. Patch is qualified to give
20 expert opinion evidence in the areas identified in the
21 witness statement.

22 MADAM CHAIR: Any objections?

23 (no response)

24 Mr. Patch will be qualified to give
25 - expert evidence in the areas of wildlife habitat

1 management research, integration of wildlife and timber
2 management and habitat supply analysis modelling.

3 MR. O'LEARY: Thank you.

4 Q. Mr. Patch, if I could turn to you
5 first and just ask you generally what is the message
6 which you would like to leave with the Board as a
7 result of your attendance here and participation in
8 this hearing?

9 MR. PATCH: A. The main message I would
10 like to bring to the Board is that in New Brunswick we
11 have a system where we are applying habitat supply
12 analysis and that the technology does exist and it can
13 be done. It's implementable. It's not entirely
14 theoretical and I can show an example of this on the
15 ground.

16 Q. Fine. Perhaps you could.

17 A. Okay. I have a series of overheads
18 that I will refer to first.

19 MR. O'LEARY: Just before you proceed,
20 Mr. Patch, perhaps we could have these marked as an
21 exhibit. These are copies of the overheads that Mr.
22 Patch will be referring to in his evidence and there
23 are 18 in total.

24 MADAM CHAIR: These overheads will be
25 Exhibit 2102 and we have 18 pages to this document.

3 MR. PATCH: I have here as an initial
4 slide a diagrammatic representation of forest succession
5 in spruce fir forests. This could represent different
6 vegetative associations.

12 The key elements or assumptions
13 underlying habitat supply analysis include the fact
14 that different wildlife species depend on different
15 forest types to meet cover requirements or feeding
16 requirements or reproductive requirements or other
17 special needs.

23 Certain species may have special needs
24 such as as an example white-tailed deer for wintering
25 habitat where they need to provide winter shelter,

1 protection from the elements and so on and better snow
2 conditions under the forest canopy and those would be
3 provided as an example under later development stages.

4 Another example with might be a species
5 such as pine marten which is also adapted to live in
6 particular types of forests.

7 Now, since we are saying that wildlife
8 species depend and are associated with different types
9 at different ages class, the greatest influence on
10 wildlife populations in the long-term is what we are
11 changing the forest across the landscape in terms of
12 forest management.

13 So as we are applying forest management
14 across the landscape and we are changing the forest
15 cover from older stands to younger stands or we are
16 speeding up or altering the development through
17 silviculture, what we are doing is altering the
18 availability of habitat across the landscape over time
19 and, in turn, the representation of different types of
20 different age classes and ultimately the total wildlife
21 populations that will be supported in terms of the
22 types of species and their relative numbers.

23 What is important in terms of habitat
24 availability for species across the landscape is how
25 much area do you have, say, in these older types, how

1 much area do you have in these younger types and how is
2 that interspersed along the landscape. As I said, that
3 is influenced by timber harvesting more than any other
4 factor.

5 This just represents a portion of a
6 forest cover map. I would like to talk about what is
7 management and I will use some Baskervillian terms.
8 The definition of management would be the designed
9 intervention or articulate intervention in managing
10 different stands in a forest to achieve a stated goal.

11 So the idea of the interventions that we
12 do in forest management are the timber harvesting, how
13 that's scheduled, the silviculture activities, where
14 and when we do that.

15 We know as we apply those activities in
16 time and across the landscape that's going to have an
17 impact on the flow of forest products. The flow of
18 forest products are dependent upon the stand types and
19 the forest products could be timber and timber volumes
20 that would be associated with different stand types or
21 they could be as a forest product, if you will, the
22 wildlife habitat that's provided by those stand types
23 at different ages.

24 I think it's critical to address, and
25 this is not the biggest scale or the best scale, but it

1 is important to consider scale and that the
2 interventions we do on the forest and in the forest
3 landscape occur at the stand level or at groups of
4 stands. So you can individually go in and say cut this
5 particular stand.

6 That in itself does not constitute timber
7 or wildlife management. That is a tactic that is
8 applied across the stand level, but what is important
9 in forest management over the long-term is where you do
10 that and how many do you do and its application across
11 the landscape.

12 So we have got to think in terms of
13 forest structure, think globally in terms of overall
14 what's out there and its distribution, but we know that
15 we are going to act locally in terms of our
16 interventions. So if we are going to manage forests,
17 we are going to schedule our interventions at the stand
18 level recognizing the whole time it is under a plan as
19 to what's occurring at the forest level across the
20 landscape.

21 I am going to revisit this graphic on
22 forest development. In order to manage, whether it's
23 for timber or for wildlife, we have got to predict
24 changes in our forest. We have got to know what the
25 result of our interventions will be. Not only in the

1 short term, but long term because forest management is
2 a long process. It takes a long time for a particular
3 stand to get from this stage where it is recently cut
4 to this stage where it may be operate for harvesting to
5 this stage where it may provide a certain condition to
6 provide wildlife habitat for a particular species.

7 Not only must we able to predict how that
8 stand will change in terms of timber volume, for
9 example, we have got to be able to predict how it will
10 change in terms of what wildlife species are dependent,
11 how they will respond to habitat relationships between
12 provision of a habitat and which wildlife species will
13 utilize that.

14 Now, we have undertaken a habitat supply
15 analysis approach in New Brunswick and there are a
16 couple of reasons as to why we have done it.

17 One, it's a legislative requirement. In
18 the Crown Lands and Forest Act in 1982 when it was
19 enacted there is a stated requirement to manage habitat
20 for the maintenance of wildlife populations.

21 Therefore, there is a stated requirement
22 to not only define what we want but how to get there
23 and we were asked to manage habitat for the maintenance
24 of wildlife populations. You can only predict that if
25 you know what wildlife populations you want and you

1 know the relationship between how much habitat you
2 provide and what the wildlife population responses will
3 be.

4 We were finding, as I will demonstrate a
5 little later, that we had applied certain constraint
6 approaches in terms of different areas like deer
7 wintering areas which might be analogous to an area of
8 concern, that we had an approach where you couldn't do
9 anything there because it is a special area, but you
10 can do what you want elsewhere.

11 We were finding that as a result of those
12 constraint approaches in the long-term we weren't
13 necessarily going to supply the type of wildlife
14 habitat that was required for deer winter shelter.

15 So we had a legislative requirement and
16 we also knew that our current system was in no way
17 assuring that we are providing wildlife habitat in the
18 long term.

19 In our view we saw no other alternative
20 if we were given a mandate to manage habitat in the
21 long-term than to be able to have a means to predict
22 how habitat will change and how wildlife will respond
23 to that.

24 I think another key element in New
25 Brunswick that's worth pointing out is that a lot of

1 our forest is currently either in these older stages, 5
2 and 6, or in these younger stages, 1 and 2, and that
3 there is a shortfall of representation of the type of
4 forest in these middle age classes.

5 So we have far from a normalized forest
6 or balanced age-class distribution. That creates a
7 problem for not only habitat supply, but for timber
8 supply in that a lot of our stands were at these older
9 stages where when they reach point 6 they start to fall
10 down and break up, the stands get old and they revert
11 more back to a stage 1 and recycle under themselves.

12 This is just an example of an analysis
13 that was done. I believe it was presented in a paper
14 Habitat Supply Analysis in New Brunswick, that was
15 entered as an exhibit.

16 We conducted analyses between 1984 and
17 1988 in terms of how our forest was changing which
18 showed a change from that forest with those older age
19 classes given our rate of harvesting to a forest that
20 had a more balance age-class distribution with most of
21 our habitat being zero to 50 years old.

22 What this shows is that in the future
23 there will be very little representation of mature and
24 overmature softwood habitat and that's also the kind of
25 habitat that is needed to provide a deer winter

1 shelter.

2 Going back to the constraint approach
3 that I was talking about where we delineated deer
4 wintering areas and indicated that those are areas of
5 special concern, you can't cut there but you can cut
6 elsewhere, we were finding that the rest of the forest
7 was being cut because of the dynamics of those
8 particular forest stands - meaning the deer wintering
9 area habitat - that was deer wintering area habitat
10 today would grow old, break up, regenerate under itself
11 and some 30, 40 years down in the future would not
12 provide deer wintering area habitat anymore.

13 So despite the fact that we were removing
14 area from availability for timber supply and saying you
15 could cut it, you would end up with an area 40 years
16 down the road was not providing any deer wintering area
17 habitat and your other areas that you had cut would
18 only be a maximum of 40 years old and most of our deer
19 wintering area habitat takes at least 50 years to
20 develop.

21 So we forecasted that if we weren't going
22 to do something about the habitat supply, if we were
23 applying a constraint approach, then somewhere down the
24 road in 25 to 35 years from now we would have a drastic
25 decline in our deer wintering area habitat

1 availability. The same is true for our mature and
2 overmature softwood habitat in general.

3 One key point here, going back to the
4 fact that forest management is a long-term process and
5 stands take a long time to develop, we can go along for
6 the first 20 to 25 years which would indicate that we
7 have habitat supply. We might be able to see that our
8 populations were fine, but when we got to the point
9 that that older habitat was breaking up and
10 regenerating and we didn't have any younger stuff and
11 it would take 50 years to grow back habitat you could
12 monitor your population levels and find that your
13 system was working fine and then find that your habitat
14 supply was bottoming out, but there is nothing you
15 could do about it because it would take you 50 years to
16 regenerate that habitat.

17 So there is a very high risk in only
18 looking at monitoring wildlife populations and not
19 monitoring changes in your habitat because you can
20 monitor populations and see that they were fine and
21 then reach a point where your habitat collapses and
22 presumably your populations would go down.

23 At that point your options would be
24 foreclosed to take any management action.

25 MR. MARTEL: Could I ask you question.

1 MR. PATCH: Sure.

2 MR. MARTEL: If you did not have that
3 supply problem, and it is hard to say what would
4 happen, but do you think you would have moved in this
5 direction as quickly if your analysis that you did had
6 shown that you would have had, let's say, sufficient
7 for deer? Would that have prompted the province to
8 move as quickly?

9 MR. PATCH: I think that that whole
10 problem, yes, that helped us move quickly clearly and I
11 would agree that.

12 That whole problem of age-class
13 distribution wasn't only a problem of habitat supply.
14 It was a problem of habitat supply for timber products
15 too especially when you are getting into provision of
16 sawlogs or other materials that need older stand and
17 you look down the future and say: Hey, those stands
18 won't provide that; they are too young.

19 So the whole forest growth modelling
20 emphasis in New Brunswick started because of our
21 concern of age-class distribution, the condition of the
22 forest and its impact on wood supply. It went from
23 there.

24 MR. O'LEARY: Q. Mr. Patch, perhaps I
25 can just ask you one question then. Can you tell me,

1 in your review of the materials as indicated in the
2 witness statement have you been able to identify any
3 level of analysis that's been conducted in Ontario
4 that's similar to the one that you are referring to in
5 your presentation?

6 MR. PATCH: A. No, I haven't seen any
7 material that indicates to me that anybody has really
8 explored what their future forest structure will look
9 like in terms of habitat supply.

10 I assume that that has been done in
11 particular regions, but I have not seen any materials
12 that show that.

13 Q. All right.

14 A. I am going to go through quickly the
15 process in New Brunswick and you can't talk about
16 habitat supply independent of talking about timber
17 supply because use the same models. They forecast the
18 same thing in terms of whether it is habitat for timber
19 or habitat for wildlife.

20 There are several requirements to a
21 management planning process as we employed. The first
22 is an inventory of the forest; what's out there and
23 where is it. So we have got to have an understanding
24 of the stand types across the forest, how much area is
25 within each type of stand type or working group and

1 particular age class and understand where it is.

2 You also need some ability to predict how
3 those stands will change over time, how much timber are
4 they going to provide 20 or 30 or 40 years down the
5 road, what kind of habitat are they going to provide.
6 So there is a need to have models of forest growth and
7 models of how stands will respond to harvesting or
8 silviculture interventions.

9 In order to undertake habitat supply
10 analysis, in order to look at how wildlife species
11 might respond, there has to be an understanding of
12 habitat relationships; what wildlife species need what
13 types.

14 We were doing timber supply modelling and
15 timber supply analysis and rudimentary habitat supply
16 analysis in conjunction with those with data that was
17 collected in the 1970s that we felt was inaccurate and
18 didn't reflect the forest conditions in the way that we
19 would have preferred.

20 So New Brunswick made a commitment to
21 upgrade their inventory. They essentially took colour
22 aerial photography across the province, people looked
23 at the aerial photography and interpreted the different
24 stand types and it was a lot of ground truthing and
25 ground work. So we defined forest conditions in terms

1 of the species association and the age class and other
2 attributes like the canopy closure of forest different
3 forest stands and any other attributes.

4 The key element in our inventory, and
5 this is common on other inventories, if you can
6 describe the types of species that are there in the
7 forest canopy, if you can describe the current
8 development stage or age class of that particular
9 stand, then you can make a relationship between what
10 that stand will provide now and into the future for
11 timber and what it can provide now and into the future
12 for wildlife habitat.

13 Q. Mr. Patch, perhaps you can go back to
14 that overhead once again. I think you pointed to it,
15 but perhaps you can be a little more specific. Under
16 the heading Forest Conditions, the references you have
17 there, can you explain those just a little more, the
18 SP7, BF2 and M63?

19 A. This represents a stand that is 70
20 per cent spruce species, 20 per cent balsam fir
21 species, it is a mature development stage and it has an
22 uneven canopy closure that is 50 to 70 per cent closed.

23 Now, the key element here is that these
24 are the types of descriptors that are used, not
25 necessarily the way we describe them, but the fact that

1 we are describing the forest in terms of the overstorey
2 species, in terms of its stage of development and in
3 terms of something that describes its structure.

4 Q. Thank you.

5 A. I will just slap this on and off.
6 This is just to represent -- we input our data and
7 digitized it. It was put on a geographic information
8 system.

9 We felt that in our situation with the
10 potential wood supply and habitat supply shortages that
11 it was very important to us to be able to spacially
12 reference exactly where our activities were going to
13 take place for timber harvesting through the future.

14 So to become more efficient we purchased
15 in 1982 a geographic information system and all this
16 represents is that all the GIS does in my mind is not
17 only describe the individual stand types in terms of
18 their characteristics or their attributes, but also
19 describes in a computerized way where exactly those
20 stand types are.

21 This is a representation of a development
22 curve. This is used in forecasting how a stand will
23 change as it grows through those different stages, as I
24 showed in the very first slide. This represents a
25 timber volume development pattern in terms of cubic

1 metres of softwood volume as the stand ages or grows
2 through time.

3 So it was not obviously enough to have an
4 understanding of our stand types and their
5 characteristics and where they are. We had to develop
6 a series of projection curves for how these things
7 might change as they aged.

8 Where those arrows are, here and here,
9 represent what we call operability limits. It is
10 saying that that stand is between those ages, between
11 those particular points it is providing a certain
12 value. In this case the operability limits are for
13 timber and that the stand before it reaches this age,
14 even though it has got a lot of volume, it is too many
15 small stems so it is not operable for harvest.

16 At this stage after the stand has grown
17 through and it is starting to die off and starting to
18 regenerate itself it has got less volume, but it has
19 got a lot of big stems so it is still operable. So
20 that helps us define through time when a stand can be
21 intervened with in terms of harvest.

22 That same type of operability limit
23 concept can be extended towards wildlife habitat and
24 that's something else that we have done in that
25 inbetween certain development stages of a stand it has

1 the characteristics to either provide or not provide
2 habitat for a particular wildlife species. An example
3 would be this could be the boundaries within that
4 provide suitable deer wintering area habitat.

5 MR. O'LEARY: Madam Chair, I see we are
6 getting close to the lunch hour. I don't believe Mr.
7 Patch is going to be able to complete all the overheads
8 before lunch. Perhaps I could just ask Mr. Patch to
9 indicate where might be an appropriate place to break
10 for lunch.

11 MR. PATCH: Well, I won't be that much
12 longer with the overheads.

13 MR. O'LEARY: All right.

14 MR. PATCH: It is up to you.

15 MR. MARTEL: Could I ask a question. Mr.
16 Patch, could a province possibly introduce -- if you
17 have to look at the forest overall--

18 MR. PATCH: Yes.

19 MR. MARTEL: --could you introduce
20 piecemeal habitat supply analysis modelling and not
21 know what's in the forest right across the area of the
22 undertaking?

23 MR. PATCH: It would be possible to
24 introduce that type of approach on any particular
25 management unit which in our case would be a forest

1 management agreement area, a Crown timber licence.
2 These could be applied everywhere or they could be
3 applied in a particular area.

4 The key thing is that these procedures or
5 something like them are to be applied on one particular
6 management unit at any one time.

7 MR. MARTEL: But in Ontario the wildlife
8 management unit does not have the same boundaries as
9 the forest management unit. Does that compound the
10 difficulty?

11 MR. PATCH: It can make things more
12 complex if your wildlife management unit boundaries do
13 not go along the same boundaries of your crown timber
14 licences.

15 We have got the same problem. What we
16 have done is we have identified the habitat in
17 different wildlife management zones where we assess
18 populations. We have looked at the amount of any
19 particular licence area in that zone and it's
20 calculated or prorated how much habitat or what it
21 should supply as its contribution within that
22 particular zone.

23 MADAM CHAIR: The Board will break for
24 lunch now if it's all the same with you, Mr. Patch, and
25 we will be back at 1:30.

1 ---Luncheon recess at 12:00 p.m.

2 ---On resuming at 1:30 p.m.

3 MADAM CHAIR: Good afternoon. Please be
4 seated.

5 Mr. O'Leary?

6 MR. O'LEARY: Thank you, Madam Chair.

7 Q. Mr. Patch, may I invite you to
8 continue with your presentation.

9 MR. PATCH: A. Sure. This is where I
10 left off. The last slide I showed was a development
11 curve which represents a development pattern, in this
12 case a softwood volume in a particular stand point in
13 the New Brunswick situation.

14 This is an example of the species marten
15 in terms of an understanding in the literature of their
16 habitat requirements. The suitability for habitat is
17 increased in the top graph as there is an increase in
18 per cent canopy closure. The suitability for marten in
19 terms of habitat increases with an increasing canopy
20 closure comprised of fir or spruce and this shows that
21 habitat suitability for this particular species
22 increases as the stand type advances in successional
23 stages; in other words, at its older successional stage
24 it provides more suitable habitat.

25 Another important point. This particular

1 species and their habitat suitability has to do with
2 the ground surface which is covered by downfall or dead
3 and down woody material in the stand.

4 The point being there is information
5 available on species describing --

6 MR. MARTEL: How many species do you have
7 that for, that sort of information in addition to pine
8 marten and deer, I guess, because there is some mention
9 of that?

10 MR. PATCH: I am turning to Dr. Thomas
11 because --

12 MR. MARTEL: I am just talking about New
13 Brunswick at the present time.

14 MR. PATCH: In New Brunswick we have
15 about 160 species for which we have identified have
16 some need of forest habitat. As far as very specific
17 models, there is only a handful of species for which we
18 have developed to this refinement.

19 MR. MARTEL: You have refined it for the
20 pine marten. What else?

21 MR. PATCH: White-tailed deer in terms of
22 deer wintering area habitat.

23 MADAM CHAIR: I believe Dr. Baskerville's
24 testimony is that there are about seven or eight
25 habitat supply curves that have been developed--

1 MR. PATCH: Yes, there is a number of
2 them.

3 MADAM CHAIR: --for New Brunswick and you
4 are working on 15 as a first step to get completed.

5 MR. PATCH: Yes. I couldn't give you an
6 exact number off the top of my head of what the habitat
7 relationship staff have in their back pocket in terms
8 of relationships, but there is a handful of species for
9 if they have developed habitat relationships.

10 DR. THOMAS: Could I interrupt for a
11 minute. That's not to say in New Brunswick or anywhere
12 else there is not additional information for other
13 species, but it won't be this specific.

14 It might be down to the point that this
15 species is most commonly found in this plant community
16 in that condition and that would be the limit of the
17 knowledge, but that's considerably more than knowing
18 nothing.

19 MR. PATCH: That's correct. There are
20 different levels of knowledge and refinement.

21 The key is being able to relate these
22 factors that provide good or less good habitat to how
23 we describe our forest in terms of the stand type and
24 its age class and we are able to do that.

25 This is just a particular list. It's to

1 demonstrate -- I indicated that in New Brunswick we
2 were forecasting a habitat supply problem with mature
3 and overmature softwood types sometime down the road
4 given how we were changing our forest structure through
5 harvesting.

6 We have identified those particular
7 forest type species, a number of mammals and birds that
8 are dependent, have a very strong preference for mature
9 and overmature softwood habitat.

10 So these are the species for which we are
11 concerned about their long-term viability or their
12 population levels given in our forecast that if we
13 weren't going to do something about it there would be
14 very little habitat in the future for these species.

15 So to a degree we have defined the
16 habitat relationship by identifying that these species
17 are linked -- or require a certain habitat type.

18 So it's less sophisticated for what I
19 showed for marten for the group, but it still is an
20 understanding of habitat dependence in relation to
21 forest types.

22 In development of the 1992 management
23 plans, we are going through a process in New Brunswick
24 at every five years the timber companies are required
25 to submit a 25-year management plan where they outline

1 specifically where and when they are going to harvest,
2 and I will illustrate more on that later.

3 There is more involved in this '92 plan
4 than there was involved in 1987 and, in turn, then what
5 was involved in 1982. So we considered an adaptive
6 process in terms of the long-term plans, every five
7 years we reassess our data, reassess our understanding
8 and develop a new long-term plan.

9 Within every annual period there is a
10 requirement to submit an annual operating plan which
11 specifically lays out their activities for the next
12 plan. The annual plan is required to follow the
13 management plan guidelines.

14 The added requirements in the 1992
15 management plans for all Crown timber licences in New
16 Brunswick that weren't requirements in the 1987 plans
17 was for industry in developing their plans look at
18 wildlife habitat supply for deer wintering area
19 management units and for mature softwood habitat
20 blocks.

21 We have also become more sophisticated in
22 looking at different harvest methods beyond just
23 clearcutting and looking at selection harvesting in
24 areas where it's appropriate to practise uneven aged
25 management in stands that are all even ages and for

1 which the best practise is clearcutting.

2 We have also --

3 MADAM CHAIR: Sorry, Mr. Patch. How
4 supportive is the New Brunswick forest products
5 industry with respect to the wildlife requirements
6 under your timber management plan?

7 MR. PATCH: Well, last week I was in
8 talking to the vice-president woodland for the major
9 pulp company in my region and I said people are going
10 to ask that, what would you say.

11 Initially when we were imposing habitat
12 supply analysis as a requirement industry was quite
13 concerned about what impact it would have on wood
14 supply and quite concerned on the complexity it would
15 have on their requirements to develop the plans.

16 They've had quite a change in attitude in
17 that they have recognized that the demands haven't been
18 as high as they have expected and there has been quite
19 a shift in attitude because of marketing requirements.

20 When people are coming in to ask them for
21 their forest products from Europe and other places they
22 are saying: What are you doing with respect to
23 managing your lands for benefits or environmental
24 concerns other than just timber. So they pass on
25 documents saying: We are managing for wildlife

1 habitat.

2 So in our area we are directly involved
3 in the requirement to manage wildlife habitat. The
4 industry has given a very strong endorsement.

5 I should point out that in the 1982
6 process we recognized that in terms of the forest there
7 are areas that are excluded because they might be areas
8 of concern or equivalents like deer wintering areas,
9 water course buffer strips and there will be other
10 areas that would be inaccessible from the timber supply
11 as a result of steep slopes or other concerns about
12 operability.

13 When we went through the 1982 process we
14 arbitrarily factored in a 15 per cent reduction in the
15 allowable cut in the area available to take in
16 non-timber concerns.

17 In the process we are going through now
18 there is no arbitrary reduction in available area for
19 timber supply. We very explicitly defined what they
20 have to provide in terms of habitat and incorporated
21 that in the plan and the net impact on reduction of
22 allowable cut will probably be around the same level of
23 the impact and reduction of allowable cut that we
24 arbitrarily imposed 10 years ago.

25 MADAM CHAIR: 15 per cent?

1 MR. PATCH: Yes. In terms of information
2 going into the 1992 management plans for each Crown
3 timber licence, there are deer wintering management
4 units that were identified by the fish and wildlife
5 branch and regional natural resources staff that were
6 provided to the timber companies.

7 The timber companies were provided with
8 areas that could potentially provide for mature
9 softwood habitat through the future and left up to the
10 company -- they were given an objective, but for them
11 to define where those areas could be and, in turn, when
12 they submit the plan we will assess and determine
13 whether we agree with their plan and approve it.

14 In terms of the tools and the input to
15 the management plan, we used the FORMAN model, forest
16 management forest growth models. We are using two
17 models now; one for even aged management which is the
18 one that is being imposed on most of the landscape and
19 also an uneven aged management model.

20 The type of input in terms of what goes
21 into the computer files for the modelling are the deer
22 habitat, the mature softwood habitat, the rest of the
23 forest and the forest that given its condition is
24 suitable for uneven aged management. We also provide
25 curve files; in other words, those development curve

1 files for timber yield for different forest types and
2 different areas and for wildlife habitat.

3 It's interesting to point out that a lot
4 of these slides that I have got came from a public
5 presentation by a Crown timber licensee in my region to
6 interested parties in the 1992 forest management plan.

7 This is just an example of a forest cover
8 map where the area is outlined here represent deer
9 wintering area management units. This is a different
10 concept than we had in the past where we identified
11 deer wintering areas as to where deer were currently
12 wintering and drew a boundary around those stands.

13 As I indicated, in our forecasts given
14 those stands would change over time and would no longer
15 supply deer habitat at some point in the future, we
16 expanded our deer wintering areas to include areas in
17 and around or adjacent to existing deer wintering areas
18 that could provide habitat in the future.

19 So instead of just managing site
20 specifically only in the particular areas that deer
21 were currently using, we expanded into what we call
22 deer wintering area management units to represent
23 stands up and down the watershed for which you could
24 manage for a supply of stands that meet your habitat
25 characteristics.

1 These deer wintering area management
2 units were established and given to all the Crown
3 timber licensees, the companies.

4 MADAM CHAIR: Excuse me, Mr. Patch.
5 These deer wintering management units are separate
6 boundaries that have been imposed on the forest or put
7 on the forest?

8 MR. PATCH: Yes.

9 MADAM CHAIR: Are you saying that you
10 don't manage for deer in areas where you don't have
11 these units?

12 MR. PATCH: That's correct.

13 MADAM CHAIR: What per cent of the forest
14 is covered by deer wintering management units?

15 MR. PATCH: It depends on the individual
16 Crown timber licence. The ballpark range would be from
17 maybe 3 per cent to something less than about 10 per
18 cent of the forested area would be delineated in deer
19 wintering area management.

20 MADAM CHAIR: So a company, a licensee
21 for example, wouldn't manage for deer outside of these
22 management units?

23 MR. PATCH: Not for deer winter habitat.
24 They would be managing for habitat in providing the
25 other early successional habitat through harvesting

1 that meets the deer needs, but it is only within those
2 areas that they are managing for the mature softwood to
3 provide winter cover.

4 One factor about deer is that they are
5 site specific. They will winter in traditional areas
6 within a particular watershed that not only are the
7 right forest type, but have the right sort of
8 topographic characteristics that they traditionally
9 use.

10 So what we are looking is within an area
11 that has been proven to be used for deer let's manage
12 for the proper age classes to provide deer winter
13 habitat. If we did that elsewhere or everywhere we
14 would provide deer winter habitat where it would very
15 likely not be utilized and in addition to that would
16 not be needed.

17 MR. MARTEL: Tell me what the difference
18 between that constraint is?

19 You are drawing a line around where they
20 would go, where they might stay for the winter and feed
21 and so on and we have heard a great deal of evidence
22 that there is a big difference between constraint
23 management and habitat supply management.

24 Now, tell me, what is the real
25 difference? I mean, you have blocked off an area any

1 way.

2 MR. PATCH: Yes.

3 MR. MARTEL: What's the difference?

4 MR. PATCH: The difference is we are
5 going to forecast in that area how it will change in
6 time and test to see whether it provides the habitat.

7 In an old system, you draw a boundary
8 around that and say: That's a deer yard, you can only
9 cut there with cut sizes of a certain amount or
10 distribute your cuts in a certain way and say that's a
11 constraint; you can only harvest here under a certain
12 prescription. Assume, without even forecasting through
13 the future, that as a result of applying those
14 constraints that you are going to provide the habitat.

15 When you have an area that you delineate
16 and then for which you are going to apply only certain
17 prescriptions and you predict through time whether
18 through application of those prescriptions you meet an
19 objective it no longer become a constraint, it becomes
20 a tactic.

21 There is a difference there, in my view,
22 between a constraint where you just draw boundaries
23 about something and only allow certain activities and
24 then assume it will turn out right and where you draw
25 boundaries around an area and apply tactics, forecast

1 whether they will be successful and then make your
2 management decisions accordingly.

3 DR. THOMAS: I think you are also
4 applying different management prescriptions through
5 time in order to achieve your objective.

6 MR. PATCH: Yes.

7 DR. THOMAS: The objective is just not
8 satisfied by delineation.

9 MR. PATCH: No. Is that difference
10 clear?

11 MR. MARTEL: I didn't get it all down,
12 but I can look in the transcript.

13 MR. PATCH: It is an important
14 distinction, in my view.

15 We have laid out rules as to what
16 constitutes mature softwood habitat that has to be
17 supplied and these rules or definition of habitat
18 required are based on an understanding of what marten
19 needs as a particular species.

20 So we have identified that we want to
21 provide areas across the landscape on the forest, on
22 the ground that are 500 hectares in size and are at
23 least 75 per cent composed of mature softwood habitat.

24 If they meet those types of criteria,
25 then we feel they meet the habitat requirements for

1 marten and we are assuming because marten is a species
2 that has relatively demanding habitat requirements,
3 then we will meet the habitat requirements of that
4 spectrum of species that I showed you earlier that are
5 dependent upon mature softwood habitat.

6 That just illustrates where we
7 highlighted on maps areas that based on their current
8 stand condition could provide mature softwood habitat
9 for a period of at least 25 to 35 years in the future
10 and that's what is shaded there and it's up to the
11 timber companies to delineate areas which they will
12 manage to meet those minimum 500 hectares, 75 per cent
13 in a mature forest condition those types of criteria
14 that we have established.

15 This is an example of habitat suitability
16 for wildlife yield curves. In this case it is for
17 spruce fir, mixed stands with a high canopy closure.
18 So those stands that have those attributes, for example
19 between 40 and 120 years of age will provide the
20 characteristics to provide good deer wintering area
21 habitat and sometime between the period of 60 and 160
22 years of age meet the -- or have the type of structural
23 characteristics in terms of the stands to provide
24 habitat for marten.

25 So in terms of the analyses, the computer

1 analyses that are being done the inputs are the
2 different class files and are identifying all the
3 different stands that are in the deer wintering area
4 management units in the mature forest, in the rest of
5 the forest and in the forest -- the uneven aged forest.
6 For each of those there is a set of development curves
7 describing how they will change in time those
8 particular forest classes.

9 Then in terms of developing of an actual
10 management plan, an input that is the level of
11 harvesting and different methods and the level of
12 silviculture and different method. The output will
13 give the area and volume harvested, the volume that can
14 be sustained, the amount of area for which silviculture
15 is done and the area of habitat availability if you
16 take a certain harvesting and silviculture strategy
17 over time.

18 That's output for each forest class for
19 the deer wintering area management units, for the
20 mature and overmature softwood forest and for the rest
21 of forest there is an output of the amount of area in
22 each class at each each five-year interval. This is
23 done through an 80-year time horizon.

24 This is the last slide. The exercise I
25 have described to date takes the information from the

1 forest cover maps, from the geographic information
2 system and it is run through a computer based on our
3 understanding about how stands will change in time in
4 terms of their timber volume development patterns and
5 in terms of those that will provide wildlife habitat.

6 What we have got to translate that into
7 is something from a theoretical model based on computer
8 information into something that's actually laid out on
9 the ground and actually applied.

10 So we have actually got to block those
11 areas, identify where they are on the ground for
12 different types of habitats and to lay out specifically
13 the areas that are going to be harvested by different
14 methods.

15 This plan is for a 35-year horizon and
16 what that means is that they are laying out
17 specifically the areas that they're going to harvest
18 within seven different five-year periods.

19 Once we have translated it into an actual
20 blocking on the ground harvest schedule and
21 silviculture schedule -- or harvest schedule, then we
22 put it back into the computer and make the computer run
23 what we anticipate will actually happen on the ground.

24 The computer runs that are done are what
25 we call non-spatial in that all the different forest

1 classes within a Crown timber licence are lumped
2 together in accordance with their species type and
3 their development stage and their site types and other
4 characteristics.

5 We recognize that when you go from a
6 computer modelling exercise where you can assume you
7 can harvest where you want individual stands and when
8 you want that that's not realistic. So we have to
9 translate the modelling exercise into how we are going
10 to do it on the ground and then we force the computer
11 to follow the laid out schedule on the ground and see
12 what impact that has on your actual outputs in terms of
13 habitat, in terms of timber supply and in terms of --
14 well, those are the two major elements.

15 I wanted to use the maps on the wall to
16 illustrate that process.

17 MR. O'LEARY: Perhaps before we start,
18 Madam Chair, we could mark those as exhibits so it will
19 be a little clearer on the record.

20 Q. Mr. Patch, perhaps to begin with you
21 can simply go up and identify each map and we will
22 assign it an exhibit number and we will be able to
23 refer to it in the transcripts.

24 MR. PATCH: A. The first map is a forest
25 cover map. This was produced on our geographic

1 information system.

2 Do you want to give it a number now or...

3 MADAM CHAIR: Yes, we will, Mr. Patch.

4 What's the title on the map?

5 MR. PATCH: It is forest cover map.

6 There is nothing written on it.

7 MADAM CHAIR: All right. That will
8 become Exhibit 2103.

9 ---EXHIBIT NO. 2103A: Forest cover map.

10 MR. PATCH: All this is is a forest cover
11 map which shows each one of these individual stand
12 types. We call them polygons. Each one of these
13 individual areas is characterized in accordance with
14 its attributes in terms of the species association
15 whether it is a mature stand and the degree of canopy
16 closure. Those are the three main attributes that are
17 assigned to each stand type.

18 Currently in the province all our forest
19 resource information is digitized in a geographic
20 information system and so we can produce these maps
21 identifying the stands and where they are and what
22 their characteristics are.

23 The second map, maybe we can call it
24 mature softwood habitat.

25 MADAM CHAIR: That's fine, Mr. Patch.

1 Why don't we call this Exhibit 2103B and we will make
2 the forest cover map Exhibit 2103A.

3 ---EXHIBIT NO. 2103B: Map entitled Mature Softwood
4 Habitat.

5 MR. PATCH: In this case we have used --
6 this is an area that has a lot of mature softwood
7 habitat that's primarily a spruce dominated stand as
8 opposed to a fir dominated stand which are in the
9 process of decaying.

10 Through the geographic information system
11 we can ask the computer to produce maps that highlight
12 stands, shade them because they have certain
13 characteristics. In this case a map is produced with
14 shaded areas that are forecasted to provide mature
15 softwood habitat into the future.

16 The areas that are highlighted on this
17 map represent areas for which the Crown timber licensee
18 intends to manage for -- or project the mature softwood
19 habitat to the meet the criteria that I had on earlier.
20 It also illustrates in a different colour some deer
21 wintering areas, deer wintering area management units.

22 You can see that there is an attempt to
23 overlap because the stands that provide deer wintering
24 area habitat can for a period also provide the
25 characteristics for mature softwood habitat. So there

1 is an attempt to count those areas to meet the habitat
2 objectives for deer, but also for other species.

3 So we have defined how much habitat we
4 needed separately for deer winter habitat, separately
5 for mature and overmature softwood habitat. If it can
6 meet both objectives in the overlap, then there a
7 reduced cost in area that you have to manage a little
8 differently. So, hence, the overlap.

9 For lack of a better term -- I assume
10 this is Exhibit 2103C?

11 MADAM CHAIR: That's right, Mr. Patch.

12 MR. PATCH: We will call this a working
13 map.

14 ---EXHIBIT NO. 2103C: Working map.

15 MR. PATCH: This is a forest cover map of
16 the same area that was here. In this forest cover map
17 are blocks that were laid out that represent harvest
18 blocks that were identified in the 1987 timber
19 management plan.

20 These blocks are numbered. This one has
21 a two beside it which meant that it is a block given
22 its characteristics and given the plan was going to be
23 harvested in the period two; in other words, between
24 years 6 and 10 of the long-term plan and this one in
25 period three which would be between years 11 and 15.

1 In the interim, between 1987 and the
2 development of the 1992 plan, we have looked to try and
3 confirm whether we have put the blocks in the right
4 period. So there is a lot of ground work done to go
5 out and visit those areas on the ground and confirm,
6 was the forest resource information accurate, are these
7 stands that should be harvested 10 to 15 or 6 to 10
8 years in the future or are there ones that should be
9 harvested sooner or later.

10 We are in the process or the licensees
11 are in the process in developing their forest
12 management plans of looking at the area that can
13 potentially be provided to meet habitat objectives,
14 looking at the information we had on the harvest
15 blocking that was done in the last period and coming up
16 with a map. This is one from the '87 plan which lays
17 out across an area blocks to be harvested in this case
18 for five five-year period 25 years into the future,
19 which ones will be harvested.

20 Part of the information that's on that
21 map, also utilizing the geographic information system,
22 is to highlight the individual stands based on their
23 forest class characteristics in the computer sense
24 which period they were scheduled to be harvested when
25 we ran the computer model.

1 In turn, use that to assist in blocking
2 areas, preferably in stands that are going to be
3 harvested in similar period and then actually drawing
4 the blocks out which represent an on-the-ground 25-year
5 harvest schedule.

6 So we have gone from basically the map
7 information to the theoretical to the blocking on the
8 ground and then force the computer to run the actual
9 blocking and determine the outcome in terms of wood
10 supply, and in this go-around there is a requirement to
11 determine the outcome in terms of future habitat
12 supply.

13 MADAM CHAIR: Shall we mark that fourth
14 map, Mr. Patch.

15 MR. PATCH: We will call that harvest
16 schedule map.

17 ---EXHIBIT NO. 2103D: Harvest schedule map.

18 MR. PATCH: That concludes an overview of
19 our planning process for timber and for wildlife.

20 One thing I meant to address after lunch,
21 too, as a result of the question that came up before, I
22 wanted to indicate that we have 10 crown timber
23 licences in New Brunswick, we have 27 different
24 wildlife management units and we recognize that there
25 is overlap and they don't entirely, but we found a way

1 to make the system work based on the proportions of the
2 Crown timber licences and different wildlife management
3 units and so on.

4 So while it doesn't make the world
5 perfect, it's not an intractable problem and we found a
6 way around it and we set our objectives accordingly.

7 MR. O'LEARY: Thank you, Mr. Patch.

8 Q. Perhaps we could quickly go to your
9 evidence in the witness statement which is Exhibit
10 2097. I would ask you to turn to page 46 under the
11 heading Recommended Improvements to the Program.

12 In response to question 88 at page 46
13 dealing with improvements to the New Brunswick habitat
14 supply analysis program you state in the second
15 paragraph that:

16 "Another thing that became obvious over
17 the course of this program was that
18 changing an existing mindset and
19 entrenched attitudes in a bureaucracy is
20 difficult."

21 Flipping now to page 37 of the witness
22 statement, in response to question 69 at paragraph 2,
23 you state that:

24 "Essentially the law required us to
25 deliver simultaneous multiple benefits

1 from the forest land base. In our minds,
2 habitat supply analysis was the only
3 viable way to proceed with the
4 integration of wildlife habitat with
5 timber supply."

6 I note in your response to question 69,
7 Mr. Patch, that you refer to the law. Could you
8 identify which law it is that you are referring to?

9 MR. PATCH: A. New Brunswick passed a
10 Crown Lands and Forest Act which was enacted in 1982
11 and that's the legislation I'm referring to.

12 It contains a section -- I think I
13 referred to that in earlier evidence, but it contains a
14 section which says that habitat is to be managed for
15 the maintenance of wildlife populations.

16 Q. All right. Now, in respect of your
17 statement that there is an existing mindset and
18 entrenched attitudes in a bureacracy as you referred in
19 your witness statement, would the change in mindset and
20 operating procedures in New Brunswick, as you have
21 identified, would it have occurred in your view at the
22 same pace if the Crown Lands and Forest Act 1982 had
23 not been enacted?

24 A. Well, certainly we always held that
25 up as a flag. Our legislation says that we have got to

1 ensure that there is habitat supply over time. So we
2 need a means to predict habitat supplies over time
3 given how we are altering our forest.

4 So it would not have moved at the same
5 pace had we not had that legislative mandate to develop
6 a system.

7 Q. Thank you. Turning to question 71 on
8 page 38 of your witness statement, you identify five
9 major objectives to the habitat supply analysis project
10 and I would like you to deal with each one of these
11 objectives and compare what was undertaken in New
12 Brunswick and what would be required in other
13 jurisdictions, such as Ontario, for example, that may
14 be desiruous of implementing a similar program.

15 Perhaps we could start with the
16 definition of habitat relationships.

17 MADAM CHAIR: Which page are we on, Mr.
18 O'Leary.

19 MR. O'LEARY: 38, Madam Chair.

20 MADAM CHAIR: 38.

21 MR. O'LEARY: Note that that response
22 continues on to page 39 as well and there are five
23 objectives identified and I have asked Mr. Patch if he
24 could start with the first one.

25 MR. PATCH: Well, in terms of habitat

1 relationships, and that part of the our program, it is
2 a key element to be able to look at our future forest,
3 what's being provided and say what's the wildlife
4 impact going to be.

5 In terms of any other jurisdiction
6 attempting to do a process like this, I should
7 reinforce that nobody should try and reinvent the wheel
8 in that the methodologies for defining habitat
9 relationships are in place, literature information on
10 different wildlife species and their habitat needs,
11 those types of information are in place.

12 While there always will be some need to
13 modify in accordance with local conditions, that we
14 should not do this type of process by saying: Well, we
15 don't know enough so we have got to wait until we have
16 got sufficient information because I believe - and this
17 is a recurrent theme in Dr. Thomas' writings - that we
18 know a lot more than we give ourselves credit for and
19 if we wait until we are totally satisfied with the
20 strong understanding of habitat relationships, then we
21 may foreclosure our options in the future to manage for
22 different habitat types.

23 MR. O'LEARY: Q. Thank you. Moving on
24 to the second objective entitled Definition of a
25 Required Forest Composition. Can I ask you, Mr. Patch,

1 what would be involved in implementing this component
2 of the HSA program in a jurisdiction like Ontario, for
3 example?

4 MR. PATCH: A. Well, until you have a
5 stated goal for what you want to manage you can't
6 manage. It's not enough to say: Well, I want to
7 manage for good habitat and then not define what that
8 habitat is and that we don't have method to test
9 whether you will arrive at a certain habitat supply.

10 So there is a requirement to start the
11 management process by defining what you want in terms
12 of the future forest.

13 Now, that objective has to have some
14 rationalization based on the goals of what you want to
15 provide for what wildlife species. It has to be
16 founded on an understanding of what is realistic. A
17 certain land base depending on its forest condition may
18 or may not be able to provide for an amount of habitat
19 and the amount of numbers of particular wildlife
20 species one may need.

21 There has to be some capability to define
22 the relationship between habitat provided and wildlife
23 species. So it is a matter of understanding habitat
24 relationships, looking at your goals and defining the
25 forest composition objective. Some objective for

1 amount and distribution of area of habitat before the
2 process can start.

3 Q. Thank you. Moving to the third
4 objective, you have identified as being the development
5 of the habitat supply models, can you tell me, what
6 would be required to implement this component in a
7 jurisdiction like Ontario?

8 A. The prerequisites to a habitat supply
9 analysis system include an inventory of your forest
10 condition in terms of the individual stand types and
11 their characteristics, some means to predict how those
12 things will change in time; in other words, growth
13 models.

14 There should be an understanding of
15 habitat relationships in terms of wildlife species and
16 their needs in terms of the forest types and there has
17 to be some ability to spatially reference on the ground
18 those types and where your activities are going to
19 occur.

20 So I would say that in development of
21 habitat supply models if somebody has forest inventory,
22 if somebody has forest growth models, if somebody has
23 some understanding of wildlife responses to changes and
24 age class structure of habitat and somebody has maps,
25 spacial references, then they can do a habitat supply

1 analysis and those tools are all in place.

2 Q. Is it necessary to have the existence
3 of GIS technology before you can develop a habitat
4 supply model?

5 A. No. GIS technology makes you much
6 more efficient and cost effective in developing this,
7 but it's not an essential requirement. It can be done
8 without it.

9 In a sense just having maps in which have
10 stand numbers on maps, have their forest types
11 described and you know on which map those forest types,
12 that's a geographic information system in a very
13 rudimentary sense.

14 Q. Turning to page 39, Mr. Patch, you
15 identify objective four as being development of
16 planning and assessment capabilities. I would ask you,
17 again, how that component would be implemented in a
18 jurisdiction like Ontario?

19 A. In order to have people make use of
20 the system and apply them they have to become educated
21 as to the techniques and understand the tools and our
22 approach was through meetings and workshops with the
23 people that would be the users of the system.

24 The materials are developed and available
25 for workshops on habitat supply analysis procedures.

1 We talked about videos earlier and so on. It is a
2 matter of training staff to develop their capabilities.

3 Q. Can you give us a sense, Mr. Patch,
4 as to the cost and difficulty in training people in
5 these techniques and procedures?

6 A. I would say it's not a great cost. I
7 couldn't quantify what it cost in New Brunswick, but to
8 bring in people for a series of workshops when you
9 generally have ongoing continuing education for
10 professionals it's -- it wasn't anything that cost over
11 and above our existing operating budget for that aspect
12 of training people.

13 Q. I was wondering, Dr. Thomas, if
14 perhaps you might have a view as to -- generally as to
15 the difficulty and the costs associated in training
16 people in the United States in respect of the American
17 equivalent of the habitat supply analysis model?

18 DR. THOMAS: A. The rudimentary habitat
19 supply analysis information that we put together
20 together for the Blue Mountain which was the kick-off
21 effort in the United States was done for certainly less
22 than \$100,000. There was no additional budgeting
23 allowed to it. We just did it because we suddenly
24 realized that we could do it and the need for it was
25 very obvious.

1 Q. That is the development of the model
2 itself?

3 A. That was the development of the base
4 information that goes into habitat supply analysis.
5 Habitat supply analysis, once it caught on, has become
6 more and more sophisticated with time, but in order to
7 make anything work you have to have information
8 available to you.

9 It suddenly was obvious that we could do
10 it, we were required to do it by law, needed to do it
11 in order to move on efficiently and effectively with
12 our work because we were being stopped in appeals and
13 in court cases.

14 So we brought it on. There was never any
15 money appropriated to do it. We saw the necessity for
16 it and saw what the efficiencies would be in the
17 long-term, so we just worked it in under our regular
18 program.

19 The training to do it, for other people
20 to do it was largely borne by my travel cost to various
21 places to train people to start to develop their own
22 databases. However, that's evolved since that time
23 into the Wildlife Habitat Relationships Program in the
24 United States which employs I think about four
25 full-time professionals for the entire U.S. that

1 provide guidance to various other sublocations and how
2 they would develop their own information.

3 The information required varies from
4 locale to locale. For example, you would be worried
5 about spotted owl in Oregon on the west side but would
6 not be concerned about spotted owls in Montana. So
7 there are specific localized needs, but the techniques
8 to be applied are very similar everywhere and people
9 can be trained on those basic techniques rather
10 quickly.

11 Q. Dr. Thomas, you indicated as we
12 perused your curriculum vitae that you are an adjunct
13 professor and that you have been involved to a
14 significant extent in graduate students in the United
15 States.

16 Can I ask you whether or not you have any
17 sense as to whether or not these students are being
18 educated and provided with the skills you feel are
19 necessary to deal with the American equivalent of the
20 habitat supply analysis model?

21 A. Not universally. Various schools are
22 more adept at this than others. Various individual
23 students are more inclined to want to know about it
24 than others, but it's being commonly put forward.

25 Planning in the United States is required

1 by law. We are in our second evolutionary 10-year
2 period of dealing with planning. One of the things
3 that we knew we were caught short on in the first
4 ten-year go-around was habitat supply analysis for fish
5 and wildlife. It caused us incredible problems. I
6 don't think that that was because we didn't want to.
7 It was because we didn't know how to.

8 The second time around I think it will
9 be -- we have learned how to do it. We now know from
10 sad experience that either we lead and do it correctly
11 or we will be forced by additional legislation, in my
12 opinion, or continuing to lose court cases to be forced
13 back to that analysis because it is very obvious that
14 the primary activity affecting forest wildlife is
15 management of the forest for wood products.

16 Q. Thank you, Dr. Thomas. Not to leave
17 you out, Dr. Page, if you have a comment perhaps in
18 respect of British Columbia?

19 DR. PAGE: A. Our experiences are
20 essentially parallel. I think particularly relevant is
21 that as the technology has become more elaborate the
22 training costs have actually decreased.

23 In other words, there are more and more
24 people today that are familiar with the kind of
25 technology that we are recommending is available here,

1 such as geographic information systems, than were
2 available two years ago. Staff that are coming on line
3 now are generally pretrained in these technologies that
4 the organization itself had to incur major costs to
5 retrain previously.

6 One thing that we are continuing to do is
7 to cross-train employees, though, in the sense that we
8 will train foresters to understand the biological
9 principles behind the models and also to try to get the
10 biologists to understand the forestry principles behind
11 the models.

12 DR. THOMAS: A. May I speak one more of
13 one of the greatest experiences we had and the level of
14 technology we have available. When we were doing very
15 intensive analysis and still are in recovery plans for
16 the northern spotted owl, that portion of the United
17 States Forest Service did not GIS available. It was
18 merely coming on line.

19 We could compute all the necessary
20 information. It was there, it was mapped, it was
21 available but we were essentially having to pull it out
22 by rather primitive techniques.

23 There is another large land management
24 agency that control forest land in that area which is
25 our Bureau of Land Management. They had a fully

1 operational GIS system in place. They were giving us
2 turn around on information request in six hours that
3 was taking us six to 12 days to pull out of the
4 information basis that the Forest Service had.
5 Information basis were the same, the technology was
6 different in terms to be able to exploit it quickly.

7 What the interesting thing was that the
8 information that was being exploited had not been
9 gathered for wildlife management purposes. It had been
10 gathered for timber management purposes, but it was
11 precisely the same information that we needed to know.

12 So BLM was able to give it to us with
13 very short turn-around and as you develop a process and
14 you are probing for information you sometimes have to
15 continue to go back for reanalysis of that information
16 and they were giving us that turn-around.

17 Of course, we would go back to the Forest
18 Service people and they would say: Oh my gosh, here we
19 for another set of 12-hour days for six days to pull
20 the same information.

21 The point that I am trying to make is we
22 were able to do in both cases, but the efficiency is
23 much improved in terms of the technology and who has
24 it, but it utilizes the same databases and the same
25 approaches.

1 Q. Mr. Patch, could I ask you then to go
2 to the fifth objective on page 39 of the witness
3 statement and identify that component as the
4 development of public awareness of HSA planning.

5 Could you tell us a little more about
6 that in New Brunswick and what would be required in
7 your view to implement it elsewhere?

8 MR. PATCH: A. Well, we have been
9 emphasizing sort of the technical ability to proceed
10 with habitat supply analysis, and while we are moving
11 in this direction I feel that we could probably do a
12 better job in terms of developing public awareness. We
13 don't have the requirement for a formal consultative
14 process in our management planning at this time.

15 In order to develop public awareness of
16 habitat supply analysis we have gone through user and
17 interest groups and educated them as to the process and
18 had their support.

19 The forest industry currently is taking
20 on the most active role in my particular region.
21 Miramichi Pulp & Paper are leaders in New Brunswick in
22 bringing in concerned citizens and local leaders and a
23 variety of people representing interest groups and
24 asking them for their input on objectives for the Crown
25 timber licence in the area and we have been involved in

1 that and essentially tried to explain that we are
2 making an attempt to manage for an assured supply of
3 habitat through time.

4 That's something that we weren't doing in
5 the past and that's been very effective. Over the last
6 two years the industry there has taken over 2,000
7 people on tours in the woods on buses to take them out
8 on the ground and say this is forest management, this
9 is how the forest is changing and then invited them
10 into meetings and said this is part of our planning
11 process. So we have been effective in involving
12 industry to take a lead role to educate the public.

13 Of course, there always has to be a
14 strong government role in terms of information
15 dissemination. We are dealing with public lands. It
16 is government that is setting the standards and
17 requirements that have to be met on those Crown lands.
18 There is a requirement for government to inform the
19 general public on what is going on.

20 Q. Moving down the page in your response
21 to question 72, you indicate or you describe the
22 staffing requirements in New Brunswick.

23 Are you aware, Mr. Patch, of the size of
24 the area of the undertaking in Ontario in comparison to
25 that of New Brunswick?

1 A. The area of the undertaking is in the
2 order of 12 to 14 times larger than the area of
3 undertaking, if you will, in New Brunswick in terms of
4 the Crown lands that are under this management system.

5 Q. All right. Are you aware of the
6 number of forest management units we have in the area
7 of the undertaking?

8 A. It's approximately 100.

9 Q. All right. Can I ask you whether or
10 not there is any relationship between the number of
11 people you need in New Brunswick given the size of the
12 area and the number of people that would be required in
13 Ontario given this 12 to 14 fold increase?

14 A. Well, the average size of the
15 management units in New Brunswick is similar to the
16 average size of the units in Ontario. So we are
17 dealing with a similar size of forest management units.

18 I think in response to, do we need
19 therefore 12 to 14 times as many people if we have got
20 12 to 14 times the land area, I think clearly the
21 answer to that question is no.

22 The activities that our central staff
23 provide in habitat relationships and in the forest
24 growth model development and so on, we don't have to
25 add additional teams to do those centralized type

1 activities because we would add more management units.

2 Clearly, there is a need to increase
3 staffing levels to implement. So those people who are
4 involved in the coordination and the technology
5 transfer to get users to apply forest growth modelling
6 tools to look at habitat supply and timber supply,
7 there would be likely a proportional increase in staff
8 dedicated towards those duties, but I would say that
9 doesn't mean that they have to hire or anybody would
10 have to hire those people.

11 There are already resource management
12 professionals employed working on forest management on
13 those units. It's largely a degree of training and
14 reallocation of duties so they can utilize these tools
15 more than it is having to hire 10 times as many.

16 Q. Mr. Patch, in response to one of my
17 questions a few moments ago in relation to objective
18 No. 3, development of habitat supply models, you
19 indicated that forest growth models were one necessary
20 piece of information that was required.

21 Can I ask you whether or not habitat
22 supply analysis can be conducted in the absence of
23 forest growth models?

24 A. No. I would say that with an absence
25 of an ability to predict how your forest is going to

1 change through time you couldn't predict what your
2 habitat is going to look like in the future anymore
3 than you can predict the future impact on the flow of
4 timber if you didn't understand the changes in stands
5 as you would get an understanding of through forest
6 growth modelling.

7 Q. All right. Do you have any
8 information as to whether or not such models are
9 presently in existence in Ontario in the area of the
10 undertaking?

11 A. The models that I have outlined in
12 terms of the FORMAN model, it's currently being applied
13 in Ontario, that's my understanding, in certain regions
14 or districts.

15 Q. Turning to page 41 of your witness
16 statement, your response to question 76 in the second
17 paragraph of your response you state that:

18 "The use of the habitat supply model and
19 an adaptive management approach allows us
20 to explicit quantify the tradeoffs being
21 made between timber objectives and
22 wildlife objectives for the first time.
23 This is an important breakthrough. When
24 operating under a constraint management
25 approach it is not possible to truly

1 quantify these tradeoffs."

2 Could you elaborate on why it is not
3 possible to quantify tradeoffs using a constraint
4 management approach?

5 A. In a constraint management approach
6 the objectives aren't set in terms of the type of
7 habitat that is to be provided. So you can't quantify
8 the tradeoff between timber supply and applying the
9 constraint in terms of habitat supply.

10 A constraint approach would be a type of
11 approach that we had in the past in New Brunswick where
12 we left the deer wintering area and drew boundaries
13 around it, as I said, and we would only allow
14 harvesting to occur in a way that would improve the
15 habitat on that particular area, but by applying the
16 constraint itself without an ability to predict what
17 would happen if we applied those types of constraints
18 through time and in different areas we couldn't
19 quantify what the result would be in habitat.

20 Q. In respect of your response, Mr.
21 Patch, can I ask you to turn to Exhibit 2102 which is
22 the overheads at item No. 4.

23 Can I ask you whether or not that
24 overhead in any way relates to your last response?

25 A. Yes, it does in that we through

1 habitat supply analysis approach analyse the impact of
2 applying a deer wintering area constraint approach on a
3 of deer habitat in the long-term and it showed that
4 failure to consider about how stands within those areas
5 would change over time would result in a future
6 shortfall and reduction in area actually providing deer
7 wintering area habitat.

8 So we had a constraint approach in place.
9 We tested what would happen if we applied that as we
10 had it and given our forest condition circumstances it
11 showed that we had very high risk and bad news in the
12 future with respect to providing deer winter habitat.

13 Q. Thank you. Now, in the last sentence
14 of your response to question 76 on page 41 you state
15 that:

16 "In a constraint management approach one
17 is forced to assume that the application
18 of constraints and time and space will
19 result in meeting habitat objectives."

20 Can I ask you why you have underlined the
21 word assume in response to that question?

22 A. I can draw the analogy again to the
23 deer management guidelines that we -- Deer Habitat
24 Management Guidelines we had in New Brunswick. It would
25 be the same as potentially the moose habitat guidelines

1 in Ontario where rules are in place as to the size of
2 cuts you can do and distribution, activities that can
3 be undertaken in particular areas.

4 In a constraint approach alone there is
5 no guarantee or no analysis that through applying those
6 types of rules that you will in fact result in a future
7 forest that provides the habitat you really want.

8 Those guidelines may or may not be
9 appropriate, but when you can test and see whether
10 through application of those guidelines through time
11 you result in providing certain habitat, then they
12 longer become a constraint.

13 As I indicated earlier, they become a
14 tactic in that it is recognized that through
15 application of these procedures in the future you are
16 guaranteed to supply a certain amount of habitat and,
17 as I said, that's a very important distinction.

18 Having rules on where and when and how
19 much you can cut alone becomes a constraint, but having
20 rules on where and when and how much you can cut when
21 you forecast that will provide a certain amount of
22 habitat benefits, then it becomes a tactic.

23 Q. Turning now to page 45 of the witness
24 statement under the subheading Technical Details, in
25 the first paragraph in your response to question 86 you

1 state that:

2 "It is not appropriate..."

3 This is starting with the third sentence:

4 "It is not appropriate to prescribe a
5 single set of actions. A range of
6 alternate actions must be described and
7 their consequence in terms of forest
8 structure and wildlife responses
9 quantified so that their effect can be
10 incorporated in the HSA system."

11 Can you explain what you mean by a range
12 of alternate actions in this context?

13 A. Our process is one of trial and error
14 where we look at a range of possible actions in terms
15 of a particular cutting rate, in terms of a level of
16 silviculture and then we look at the outcome in terms
17 of long-term wood supply that can be sustainable and in
18 terms of amount of habitat that can be supplied over
19 time.

20 If you prescribed a single set of actions
21 and didn't look at the different alternatives you
22 couldn't pick the best alternative. We have certain
23 objectives to try and maximize our timber supply, we
24 have certain stated objectives in terms of providing
25 levels of wildlife habitat. We want to look at

1 different alternatives in terms of harvest rates and
2 locations of the harvesting and in terms of
3 silviculture rates and see their outcome.

4 Q. In your response to the same question
5 in the second paragraph on page 45 of the witness
6 statement, you describe:

7 "A weakness of the guidelines being their
8 failure to allow for the cumulative
9 effects of their application over a wide
10 continuous area over a long period of
11 time..."

12 You continue on and say:

13 "Wildlife populations are put at risk due
14 to the effects of piecemealing."

15 Can you elaborate on why this is a
16 problem?

17 A. Well, I go back to what I talked
18 about -- when you have guidelines they are applied at
19 the stand level on a very localized level and they are
20 also applied to look at one particular point in time;
21 the point in time for which you have applied those
22 guidelines or shortly thereafter.

23 What is really going to impact wildlife
24 species on the long-term are the larger scale, the
25 fourth level scale cumulative effects of applying those

1 guidelines or different strategies across the landscape
2 and the cumulative effect not in terms of where they
3 are done, but through time how they are done.

4 Unless there are some means to predict
5 the outcome of application of guidelines, then you have
6 risks in terms of not being able to assure yourself you
7 are going to provide the habitat you need.

8 Q. A few moments ago, Mr. Patch, you
9 made reference to the Moose Habitat Guidelines. Can I
10 ask you whether or not you have reviewed those?

11 A. Yes.

12 Q. Can you tell me whether or not the
13 comments you made in response to question 86 in the
14 witness statement and perhaps your comments just now in
15 any way relate to the Moose Habitat Guidelines in
16 Ontario?

17 A. Yes, they do in that they don't, as I
18 reviewed them, indicate an objective for amount of
19 habitat. They indicate a set of rules or course of
20 actions that you can or cannot take in certain areas.
21 Implicit in that is that through application it will
22 provide adequate moose habitat through time, but that
23 is implicit, not explicit.

24 Q. Thank you. Now, in response to
25 question 87 at the bottom of the page, you indicate

1 that in your view GIS is necessary to conduct HSA
2 modelling and in the last sentence of your response to
3 this question you qualify that response when you say:

4 "An analysis of habitat supply analysis
5 without considering spacial relationships
6 is clearly superior to doing nothing or
7 to relying on constraint management
8 approach."

9 A few moments ago I think you answered a
10 question in respect of the necessity of GIS technology,
11 but I would like you to consider this.

12 The Board has heard evidence in the past
13 that it may take up to 20 years for the area of the
14 undertaking to be fully digitized on a GIS database,
15 and can I ask you hypothetically if you assume for the
16 moment that this 20-year figure was correct and New
17 Brunswick was faced with the same problem, that it was
18 going to take 20 years to fully digitize, can you tell
19 me what your recommendation would have been at that
20 time in respect of adopting the habitat supply analysis
21 model or implementing one in New Brunswick?

22 A. Well, in New Brunswick we were doing
23 forest growth modelling and looking at habitat supply
24 with old inventory and in the absence of GIS in the
25 term 1980s. So it can be done.

1 It is not as good as could be done in a
2 world where you had better resource information and
3 information handling capabilities like GIS. It can go
4 ahead and be implemented, these types of procedures.

5 I think the example that Dr. Thomas was
6 referring to where they were proceeding with an area
7 with respect to the spotted owl controversy by
8 necessity and where there was a need to do this type of
9 thing it can be done.

10 DR. THOMAS: A. I would bring some
11 experience to bear here in that -- not to keep dwelling
12 on that except we have learned a lot from the
13 experience, the spotted owl question, is that after we
14 had finished that a committee of Congress asked four of
15 us to go back and to array some -- an array of some 14
16 alternatives, it ended up to be, to deal with the
17 particular question of late successional or old growth
18 habitats.

19 We had used in our last go-around of
20 planning a model we call FORPLAN. I suspect rather
21 similar to FORMAN, but we call it FORPLAN. That model
22 was not spatially or temporally specific. You just
23 assumed that all -- it accumulated stand data, lumped
24 it, assumed that it was all there and equally
25 attainable.

1 When a management regime was applied that
2 was spatially specific it caused us the consternation
3 of the fact that we could not meet what we call annual
4 sale quality. You call it MAD, same thing; how rapidly
5 you could cut per year. It caused a downward revision
6 of some 15 per cent in the annual sale quantity. That
7 did not come from the prescriptions. It came from
8 using models that were unable to handle spatially
9 specific variables. When we had to do it it threw a
10 constraint in that dropped those yields.

11 Now, that's not the -- that's the bad
12 news. The good news is that going back and modelling
13 we found that the more quickly we responded to spatial
14 requirements the easier it was to do and the less the
15 cost in the long term of annual sale quantity.

16 If we waited until we were up against the
17 line and we had removed most of our abilities -- most
18 of our options had been reduced, where the rules became
19 much more rigid and much more difficult to meet in the
20 short-term, there was a dramatic increase in cost. The
21 more of the options that had been eaten up, the later
22 the response time, the more effect.

23 MR. O'LEARY: Just looking at my watch,
24 Madam Chair, and I am going to move into another
25 subheading of the witness statement, perhaps now might

1 be an appropriate place for a break.

2 MADAM CHAIR: Fine, Mr. O'Leary. We will
3 be back at three o'clock.

4 ---Recess at 2:40 p.m.

5 ---On resuming at 3:00 p.m.

6 MADAM CHAIR: Mr. O'Leary.

7 MR. O'LEARY: Madam Chair.

8 Q. If I could turn you now, Mr. Patch,
9 to page 46 of the witness statement which is under the
10 heading Recommended Improvements to Program.

11 You state in response to question 89
12 that:

13 "One change you would make if you were
14 starting the HSA program over again would
15 be to marshal more resources earlier in
16 the process."

17 Can you tell us why you made the
18 statement?

19 MR. PATCH: A. Well, also in that
20 response I say we wouldn't change our conceptual
21 approach, but I believe that with more human resources
22 and more financial resources we could have built a
23 better system sooner, but I would say that what we did
24 have was a clear mandate to do the best with what we
25 had and proceed with the resources available.

1 If added resources could have been made
2 available, then we could have utilized them, but those
3 added resources weren't.

4 Q. Turning now to the subheading
5 Practical Role of HSA Models in Timber Management
6 Planning which starts at page 47, looking at your
7 response to question 92 where you were asked:

8 "How has the HSA modelling approach been
9 accepted by wildlife biologists involved
10 in timber management planning in New
11 Brunswick?"

12 You respond by saying:

13 "It was been braced by most although not
14 all wildlife biologists in New Brunswick.
15 There remain some who have not adapted
16 to this modelling approach. In my
17 opinion this is because they are not
18 comfortable in being forced to explicitly
19 define the assumptions underlying their
20 profession judgments."

21 Can I ask you, first of all, are you
22 familiar with the terms that have been used in this
23 hearing before, traceability and replicability, as used
24 by the Coalition.

25 A. Yes, I am familiar with those terms.

1 Q. Can you tell me then in relation to
2 those terms whether or not the answer you gave in
3 respect of wildlife biologists in New Brunswick not
4 being comfortable in being forced to explicitly define
5 the assumptions underlying professional judgments has
6 any relationship?

7 A. Well, in terms of a system that
8 becomes implicit, when you write down on paper that you
9 expect if you provide this habitat these wildlife
10 species will respond, the system is traceable in that
11 you have an explicit description of how it was done and
12 how you expect things to occur.

13 In terms of the term replicability. When
14 you have got down on paper a process and you reach a
15 certain conclusion and you are assessing how well you
16 are meeting or failing to meet your objectives, when
17 you do it in an explicit fashion in a way that you can
18 repeat it it is replicable in terms that people can go
19 back, they can look back at what was done, look back at
20 the assumptions that were made and actually repeat the
21 process.

22 Q. Can you tell me, how does the habitat
23 supply analysis approach cause the underlying
24 assumptions of professional judgment to be explicitly
25 defined?

1 A. I guess a good example of that would
2 be the graphs I showed where we are assuming that in
3 mature spruce fir habitat if it is between these types
4 of ages it will provide the characteristics to provide
5 deer wintering area habitat. That's very explicit. We
6 have defined a relationship between stand type and
7 where it is and whether it will provide habitat and
8 that's on paper and it is exposed.

9 Q. All right. I know you have discussed
10 already the Moose Habitat Guidelines, but I would like
11 to ask you in relation to the terms of traceability and
12 replicability are you able to compare the habitat
13 supply analysis approach with the constraint management
14 approach such as the one you have identified as being
15 the Moose Habitat Guidelines in Ontario?

16 A. Well, again, I would say that if you
17 have an approach where you had made an assumption that
18 if you apply a certain strategy over time they are
19 going to result in a certain habitat objective, that's
20 very explicit and very traceable, but if you have
21 constraints, then what you are saying is the rules of
22 the game are not to meet the objectives. The rules of
23 the game are to apply the constraint and performance is
24 based not on how well you are providing habitat.
25 Performance is based on how well you are applying your

1 guidelines.

2 I think another important fact that I
3 would try and offer with respect to explicitly based
4 assumptions and so on, we are defining like a testable
5 hypothesis in terms of this is the relationship, this
6 is the expected response we get.

7 We know that it is uncertain, but it is
8 our best information at the time and we know that the
9 world is going ahead and we are managing and altering
10 the forest regardless.

11 In light of the uncertainty we do have in
12 the natural world we are going to go with our best
13 assumptions, we are going to lay them out, what they
14 are and look at how well those assumptions are being
15 met.

16 Q. All right. Thank you, Mr. Patch.

17 If I could now turn the heat up a little
18 on Dr. Page and I would ask you to turn over to page 26
19 of the witness statement, question 44, and here we are
20 operating under the general heading Part 2, Habitat
21 Supply Analysis Initiatives in British Columbia and the
22 subheading is Description of Initiatives.

23 Again, at question 44 you make reference
24 to the Ministry of the Environment, Ministry of Forests
25 and divisional forest planners within the forest

1 industry. Can you tell us, Dr. Page, what is the
2 division of responsibility amongst these three groups?

3 DR. PAGE: A. I think it is important
4 for the Board to be aware of the differences in the
5 organizational structure of the government in British
6 Columbia to be able to put some of the things that I
7 will be saying later on into context.

8 The differences are those that exist.
9 They don't necessarily represent any better or worse
10 organization than that in Ontario.

11 The most important difference is that the
12 activities of wildlife management in British Columbia
13 are the mandate that the Ministry of the Environment --
14 Wildlife Branch within the Ministry of the Environment.
15 They are separated from the Ministry of Forests,
16 whereas in Ontario both those functions are within the
17 Ministry of Natural Resources.

18 The divisional forest planners of the
19 forest industry have a relatively large role to play
20 compared to some other jurisdictions in Canada
21 primarily because of the tenure structure which I will
22 refer to later, but the vast majority of the timber
23 management plans in British Columbia are prepared by
24 divisional foresters and not by government foresters.

25 The Ministry of Forests is responsible

1 for considering other resources in the development of
2 timber management plans and in the evaluation of timber
3 management plans, but the responsibility to mandate for
4 achieving other resource objectives lies within other
5 ministries.

6 Q. Also still in response to question
7 44, you make reference to the HAP tool or HAP tool.
8 Can you tell me, what does that acronym stand for, Dr.
9 Page?

10 A. HAP is the acronym that we use for
11 our HSA, our habitat supply analysis method, and that
12 stands for habitat assessment and planning.

13 There is a similar program in the United
14 States with the same acronym. We've had some
15 confusion. I think you will find in the presentation
16 that I will give it was called -- at one point or
17 initially our program was called habitat analysis as
18 opposed to habitat assessment. We had originally hoped
19 to be able to develop an optimization method of habitat
20 assessment; in other words, the best of all possible
21 worlds could be identified. I will be referring to
22 this later.

23 We are developing a habitat assessment
24 method that allows us to determine how successful a
25 proposed timber management plan is in achieving other

1 resource objectives, particularly deer winter range
2 habitat requirements.

3 Q. Looking at the last sentence of your
4 response to question 44 you state that:

5 "The habitat protection biologists and
6 technicians within the Ministry of the
7 Environment are the user group with the
8 greatest immediate need for the HAP
9 tool."

10 Can you tell us why that is?

11 A. The vast majority of timber
12 management plans in British Columbia are prepared by
13 industry foresters, are then submitted to the Ministry
14 of Forests where considerations are added to the plan.
15 The plan may be returned directly to the ministry
16 forester for update or changes.

17 Once it has gone through the process
18 within the Ministry of Forests it is transferred to
19 other ministries in what we would refer to -- we call
20 the referral system.

21 The timber management plan is referred to
22 other ministries by the Ministry of Forests. Those
23 other ministries then determine whether they have any
24 concerns with the proposal.

25 In the particular case of the Ministry of

1 the Environment, the wildlife habitat requirements of
2 that ministry are assessed by a group called the
3 habitat protection biologists and technicians. Those
4 are the individuals in the government agency that are
5 given the mandate, the responsibility for assessing the
6 timber management plan to see whether it meets the
7 objectives of their agency.

8 I have mentioned that the method that we
9 have can be used by all parties involved, though. Only
10 the Ministry of the Environment is required to make
11 that assessment. The Ministry of Forests and the
12 industry foresters can learn from the application of
13 the assessment method to their own plans as well.

14 Q. Thank you. Turning to page 27 in
15 response to question 45, you indicate -- set out the
16 manpower requirements to develop the HAP tool and refer
17 specifically to the report found behind Tab 17 of the
18 witness statement which is entitled Integrated Wildlife
19 and Intensive Forestry Research.

20 At page 32, table No. 1 you specifically
21 set out the manpower requirements. I notice there is
22 reference to other work going on, for example, on page
23 22 --

24 MR. FREIDIN: I am having trouble keeping
25 up with you. Where are we looking, Mr. O'Leary, sorry?

1 MR. O'LEARY: We are looking at page 32,
2 table No. 1 behind Tab 17.

3 I am now referring Dr. Page to page 22
4 where there is a reference in the second paragraph to a
5 number of other initiatives that are ongoing.

6 Q. Can I ask, Dr. Page, are the manpower
7 commitments associated with these projects included in
8 your estimates?

9 DR. PAGE: A. The manpower commitments
10 associated with the other projects identified on page
11 22 are not included, no.

12 Q. Thank you. Can you tell me
13 approximately in total how much the B.C. government has
14 had to shell out to develop and implement the HAP tool?

15 A. First of all, I would like to go back
16 to something Dr. Thomas said, was that similar to the
17 Blue Mountains we have initiated a project and
18 currently there has been no new allocation for this
19 project.

20 The HAP tool was developed only by
21 reallocation of currently existing resources; in other
22 words, the personnel and the money available came from
23 other research programs.

24 Given that, the total directly because of
25 this project that could have otherwise been spent on

1 other activities including salary costs is
2 approximately \$200,000. That's a relatively crude
3 estimate because, as I mentioned, all staff commitments
4 came from elsewhere and generally it was part-time
5 including my time. There has been a part-time
6 commitment to this project. It is difficult to trace
7 the relative proportions of those expenditures.

8 Q. Do you have an estimate as to what
9 you believe it would cost B.C. today if you were going
10 to start up the process fresh, say, tomorrow?

11 A. As in most initiatives, if you were
12 to do it a second time, the same people do it a second
13 time with the knowledge of hindsight you can always do
14 it better, presumably you can do it cheaper, but
15 difference essentially would be meaningless. It would
16 cost approximately the same for us to do it.

17 Two years is a reasonable and a fairly
18 short period of time in which to develop and implement
19 the habitat supply analysis method.

20 Q. Do you have a view as to whether your
21 answer in respect of B.C. would be applicable to any
22 other jurisdiction?

23 A. Well, as the experience in British
24 Columbia, New Brunswick and the Blue Mountains we were
25 able to achieve substantial implementation in

1 development of a model in a two-year period.

2 As in our case and as in New Brunswick
3 and clearly in the case of the United States, the
4 development and refinement continues on for for many
5 years afterwards, but certainly within one, at most two
6 years there can be a tool developed that is of use to
7 managers.

8 Q. Now, in response to question 51 at
9 page 29 regarding the matter of uncertainty and
10 insufficient data, you make reference to the report
11 again behind Tab 17, in this case page 20.

12 It starts really with page 19, in the
13 third paragraph you make reference to uncertainty in
14 management decision making and note a concern raised
15 also by Dr. Thomas that there is a tendency to assign
16 too great a level of precision to computer output.

17 The report at Tab 17 then goes on to say
18 that:

19 "The usual solution is to try to increase
20 the precision of the original data
21 sources ignoring the fact that marginal
22 increases in the precision of individual
23 data sources will have little impact
24 on the precision of the final output."

25 Can you elaborate on what you mean by

1 this comment, Dr. Page?

2 A. I think the principle underlying
3 these components is fairly straightforward and obvious
4 and I will be referring to it throughout my testimony.

5 The fundamental principle is that
6 uncertainty always exists. We can reduce uncertainty
7 about one particular aspect of some decision or some
8 product, but we can never eliminate it.

9 Given that, the presence of uncertainty
10 is no excuse for the lack of a management decision.
11 One thing that you can do to reduce the impact of
12 uncertainty on your ability to make an effective
13 decision is to try and understand which are the really
14 critically important factors in your decision.

15 In other words, if you are evaluating, as
16 an example, a deer winter range, a very critical
17 component is knowing the age of the stand. Perhaps an
18 estimate of the age is not sufficient. It is probably
19 fairly important to understand that that really is an
20 older age of trees. That clearly is a decision that
21 requires high quality data.

22 The relative types of food that are
23 contained within that stand may be a much less
24 important decision. Not too surprisingly, it is also a
25 much more difficult piece of information to gather data

1 on and about which to reduce your uncertainty.

2 You have a piece of information, a source
3 of information that you needed to make a decision, it
4 is very important and it is also relatively easy to
5 identify and to capture, like the age of a stand, you
6 should be able to make that information to make a
7 relatively precise decision.

8 Q. Dr. Page, turning you now to page 31
9 of your witness statement, at question 56 you were
10 asked:

11 "How transferable is HSA technology from
12 one area to another where the same
13 species are involved?"

14 Your response in part is that:

15 "The model is directly transferable to
16 the various regions within British
17 Columbia. The basic data requirements
18 are the same in all regions."

19 Can I ask you whether or not you have an
20 opinion as to the reasonableness of transferring the
21 HSA technology in British Columbia to areas outside the
22 province?

23 A. The transferability of the structure,
24 the kind of model that we have used is directly
25 applicable. It is directly applicable to other species

1 besides deer, it is directly applicable to other areas,
2 to all other areas.

3 I will be giving a presentation later on
4 to elaborate on that, but certainly the principles of
5 the kinds of habitat requirements for animals can be
6 relatively easily modelled in a relatively simple
7 format. I will explain in detail how and why I have
8 that belief.

9 Q. All right. In respect of that
10 portion which is directly transferable within region of
11 British Columbia, are there any specific examples in
12 other parts of western North America where there could
13 be direct transferability?

14 A. Well, in British Columbia, in the
15 area where most of our developmental work on this
16 particular project has occurred, it is on the coast and
17 the coastal ecosystem. That ecosystem also occurs
18 north into Alaska and south into the Pacific northwest
19 states of Oregon and Washington. Within those similar
20 ecological areas the information is directly
21 transferable.

22 We have a very close working relationship
23 with the U.S. Forest Service staff on both sides of our
24 borders for more than 10 years now. Dr. Hal Salweiser
25 (phoen) who has worked with Dr. Thomas was one of the

1 people that came up in 1982 to meet with our executive
2 to help initiative some of the research and the
3 programs that have led to the development of this
4 particular model.

5 The wildlife species in many of the
6 habitat components are identical on both sides of the
7 border. Those jurisdictional borders that we have
8 imposed may be relatively meaningless ecologically and
9 relatively meaningless to forest management.

10 Q. Dr. Page, can I ask you then, to what
11 extent are the ecological components of the HAP tools
12 transferable?

13 A. The ecological components I think if
14 they are well structured are directly transferable; in
15 other words, they are principles of ecology, principles
16 that are in existence among all ecosystems anywhere in
17 the world.

18 The principles that I will be showing in
19 a moment are obviously -- to any person are obviously
20 transferable or absolute requirements of the world that
21 we live in. In other words, given that the kind of
22 model that we have developed exists it could be
23 relatively transported to other places.

24 Q. Can I ask you briefly, Dr. Page,
25 could you perhaps provide us with a summary of your

1 understanding of the area of the undertaking, being
2 that portion of northern Ontario which the hearing is
3 dealing with?

4 A. Being a native of Ontario and having
5 worked and travelled extensively throughout the
6 northern half of this province, in the area of the
7 undertaking in particular, I feel I am familiar enough
8 to say with certainty what the ability to model
9 habitats would be in this province, and I have no doubt
10 at all, moose in particular and deer as a second
11 example, would be relatively easy to model.

12 Our understanding of that particular
13 species, of those two species and that particular
14 species moose is very high. It's very good. There is
15 an extensive array of data, a large body of knowledge
16 and a wide array of expertise that we have drawn upon.

17 My doctoral research was on moose and
18 wolves, but primarily on moose in the boreal forest
19 ecosystem and I presume we would be one of the experts
20 that could be utilized to develop that kind of a model.

21 Q. Thank you. Could I also ask you to
22 briefly provide us with an overview of the development,
23 the history of development and use of the HAP tool in
24 British Columbia?

25 A. I believe copies of this are

1 available.

2 MR. O'LEARY: Madam Chair, I have copies
3 that we are about to distribute here. These are copies
4 of overhead presentation projections of Dr. Page and
5 there are 14 of them.

6 MADAM CHAIR: Thank you, Mr. O'Leary.

7 MR. O'LEARY: Perhaps they could be
8 marked as an exhibit, Madam Chair.

9 MADAM CHAIR: This will become Exhibit
10 2104.

11 ---EXHIBIT NO. 2104: Hard copy of 14 overheads
12 referred to by Dr. Page in
his evidence-in-chief.

13 DR. PAGE: When the decision was made in
14 our program to begin the development of a habitat
15 analysis or assessment tool, we initiated that because
16 there was a number of individuals there that were using
17 basically the older technology which we call habitat
18 suitability indices which was extracted from the U.S.
19 Forest Service that we were attempting to apply with
20 manual methods.

21 We were using aerial summaries of forest
22 cover information and essentially calculators to add up
23 the relative amount of various habitat types in an
24 effort to determine how much habitat was available in
25 an area before and after the imposition of the timber

1 management plan.

2 We were actually directed to develop
3 those models in more detail. The researchers involved
4 decided that given the technology that was potentially
5 available around 1983 to 1985, that wasn't the most
6 appropriate method to utilize any longer.

7 British Columbia has always been a hotbed
8 of geographic information system development. Ontario
9 is also one of those areas where many companies have
10 been developing GIS.

11 We decided to work closely with the
12 companies in our province so as they developed their
13 tools they would be particularly useful and applicable
14 to our habitat supply analysis planning approaches.

15 We decided to develop this tool called
16 habitat assessment and planning and we decided there
17 were some fundamental concepts that we wanted to
18 incorporate.

19 We believed from our previous experience
20 of having developed an array of models of various kinds
21 that these concepts were going to, if applied earlier
22 in the process, ensure success. At least increase the
23 likelihood of success.

24 The first and continuing to be the most
25 important component is to keep it simple. That

1 principle is identified by Sir Thomas of Occam in 1324.
2 He didn't actually say keep it simple, but what he did
3 say, to paraphrase, is that it is vain to do with more
4 what can be done with less. In other words, if your
5 habitat model is going to work with only two components
6 only use two components. You don't necessarily have to
7 elaborate the model.

8 One of the important reasons to keep it
9 simple is that it keeps it understandable and I hope
10 that you will see later on, even though this is a very
11 technologically advanced model, it is also simple
12 enough that it can be understood by the lay public
13 public.

14 As Mr. Patch mentioned, getting the
15 public involved and understanding this habitat supply
16 analysis process is a fairly important component of
17 getting the public to accept the forest planning
18 methodologies that are in place.

19 The second important component which is
20 elucidated repeatedly by Aldo Leopold in the 1930s is
21 to include interspersed. For most animals, they can't
22 live in a single place. They must move from an area
23 that, for example, provides water to an area that
24 provides food or from where they live in the summer to
25 where they live in the winter time.

1 So we call that principle to include
2 interspersation. When you get to that level it is clear
3 then that GIS allows you to incorporate those
4 components of space.

5 The final principle which I alluded to
6 earlier was to embrace uncertainty and this was
7 eloquently brought out by that group at the University
8 of British Columbia that I worked with in 1980; Dr.
9 Holling and Dr. Karl Walters, Dr. Ray Hillborn.

10 Karl Walters in 1986 wrote a book called
11 Adaptive Management for Natural Resources and he has
12 identified the concept of embracing uncertainty. Don't
13 attempt to eliminate it, you never can; don't attempt
14 to pretend it doesn't exist; understand it exists and
15 understand what the impact of that uncertainty may have
16 on your decisions because you may in fact make a
17 different decision understanding that you could be
18 wrong than if you assume that you are always correct.

19 Mr. Patch has already mentioned the
20 importance of scale in most of these activities. This
21 figures looks a little complicated and I will go into
22 this in detail. All I want you to identify here is
23 that there are three separate components that represent
24 the three separate scales.

25 The largest scale, in our case we call

1 the region, involves certain sets of questions, certain
2 priorities that affect the next scale which is the
3 watershed, which in our case is roughly 10,000 or so
4 hectares, down to the stand level where most of the
5 interactions, interventions that forest managers impose
6 on the landscape occur.

7 In some cases we have interventions such
8 as selective harvest at a finer scale even than the
9 stand. We needed a method to incorporate those kinds
10 of differences in the scale explicitly because what we
11 wanted to be able do - and we have been successful in
12 this case - is that when our focus is on a watershed,
13 we wanted to be able to understand how that watershed
14 fit into the overall concept. I will just show this
15 figure again in a simplified form.

16 So No. 2 and No. 3 are versions of the
17 same.

18 We had a regional priorities model. On
19 Vancouver Island there is an example of one of our
20 potential regions, there are a large number of
21 watersheds. The efforts to integrate timber and
22 wildlife management cannot be just uniformly spread
23 throughout that island and be spent efficiently then.
24 It is clearly much more effective to spend that effort,
25 that money in modifying habitat and that money in

1 modifying timber management plans in those areas where
2 it is going to be most effective.

3 This model was developed to help us to
4 identify where to expend our effort of management,
5 which watersheds to work with. The major focus of our
6 research effort and our development area in the
7 development of this tool is at the watershed level.

8 There are a large array of tools
9 available to forest managers at the stand level. What
10 we call now the management options level. Once they
11 understand that there is a need for habitat or the lack
12 of a need there are many options that they already have
13 in the tools that are available to them. Additional
14 tools like silviculture prescriptions, additional tools
15 like burning versus scarification, seeding versus
16 planting. Those are the kind of options that are
17 available to a forest manager that can also and clearly
18 do have a major impact on wildlife habitat.

19 The important thing I would like you to
20 notice from this is the number of linkages. The
21 systems, the levels of scale are not separate. They
22 are also interlinked. The decisions you make in your
23 region also affect the watersheds and what you are able
24 to do there and particularly the cost of the actions
25 that you propose.

1 If you impose major costs on a forest
2 company in terms of the habitat that you require them
3 to produce, their costs, their management options are
4 reduced. They are reduced in the sense that they are
5 spending a large amount of money on that particular set
6 of activities and that money clearly is taken from
7 other activities. I think it is incumbent upon us as
8 government partners in this forest management scheme to
9 try to minimize unnecessary costs on industry and on
10 the public.

11 Finally there is a feedback. After
12 having gotten down to the stand level you may have
13 actually determined because of your assessment that
14 your habitat objectives are not actually met in that
15 particular watershed.

16 In other words, you thought that was the
17 most important watershed to focus your effort on after
18 having gone through the exercise, but before
19 necessarily having expended any money or change the
20 actual landscape you make - if this is worked
21 appropriately - identify that that particular area was
22 not the best area to try and meet your deer habitat
23 objectives. Maybe you will have to go to another
24 watershed, at which point you will go back to your
25 regional priorities and determine where the next most

1 likely area is. This kind of a process is exactly
2 that, it is identified as adaptive management.

3 At the upper level in the regional
4 priorities model we make decisions, we ask questions,
5 we try to evaluate, make a prediction about the most
6 important watershed. After having identified that
7 watershed and assessing it we may find out that
8 decision was not correct. You go back and re-evaluate
9 and you can learn from that decision as well.

10 This is an example. The questions don't
11 matter. This is an example of the kinds of questions
12 that we asked in this regional priorities model. So
13 the overall question, is the deer habitat suitability a
14 concern to the deer forester managers in this
15 particular area. So which of the watersheds that we
16 have has the areas of greatest concern.

17 You will notice this constant kind of
18 structure throughout these models, boxes within boxes.
19 It is basically a hierarchial structure. That allows
20 you to cluster similar ideas, make them easy to deal
21 with and easy to understand.

22 So as an example, the very first box is,
23 deer overall are a sensitive management issue. In the
24 case of Vancouver Island in particular there is a
25 number of questions there that need to be addressed.

1 Some of these question may or may not be as applicable
2 in Ontario, but, for an example, are the deer in this
3 area limited by predators. If they are, then you may
4 get relative little benefit by modifying the habitat
5 or having produced an excess number of deer is there
6 sufficient hunter demand to utilize that resource, is
7 there a need to produce deer in a particular area for
8 the hunter.

9 In British Columbia, because of the
10 difficulties of accessing some areas, that can be a
11 fairly important component. Some areas are still quite
12 remote.

13 Finally as an example, winter severity in
14 some areas is much higher than others. Winter severity
15 in some areas of Ontario; in other words, how much snow
16 falls, has a much greater impact on ungulates in other
17 places. If the animals will be dying despite your best
18 habitat efforts, then clearly your habitat will be
19 better placed somewhere else where the animals will be
20 able to survive to utilize that habitat.

21 The other thing that this type of
22 structure allows us to do by explicitly asking these
23 questions of the managers, rather than just saying
24 which is your most important area, we ask why is that
25 the area important. We are able to document the

1 reasons for these decisions and we are able to compare.

2 In this case we asked a set of
3 biologists, habitat protection biologists these
4 questions, some of whom were in that area, were in that
5 region and some of whom were not.

6 So the solid bars here are those that are
7 familiar with the area, the hatched bars are those that
8 were unfamiliar with the area. These are habitat
9 biologists, but they have spent a large part of their
10 career exclusively looking at deer habitat. So it not
11 too surprising in the middle you see in terms of the
12 deer population questions there is a relative amount of
13 agreement. If there was zero here that means they are
14 in agreement.

15 The greater the bars are the more
16 disagreement there was. Surprisingly, there isn't that
17 much disagreement in many cases here whether you are
18 familiar with the area or not, but there is a clear
19 amount of disagreement between the individuals.

20 So in the case of predators, whether
21 predators are important or not, whether they are
22 familiar with the area or not familiar there was still
23 a relatively large amount of disagreement about whether
24 predators are important relative to deer populations.

25 Those that were familiar with the area

1 who actually had hunters statistics available agreed
2 precisely what the hunter demand was because they
3 actually knew the answer to that question.

4 In terms of the winter severity, again
5 there was a high level of disagreement. Two biologists
6 may have both known exactly how much snow fell in that
7 particular area. One may have thought that was not
8 important to deer because he was able to manage habitat
9 to meet the requirements for deer to escape the snow.
10 Others may have thought, as an example, that that was
11 beyond their management control, but this immediately
12 gives us an idea of uncertainty of the level of
13 information, expertise of our biologists and the kind
14 of areas that we have to address.

15 If predators or winter severity are
16 important parameters in determining whether an area
17 needs deer habitat, then we clearly have to reduce this
18 uncertainty to be able to make good decisions,
19 particularly since the difference in some cases is just
20 the individual that you asked the questions of.

21 So you have seen this figure already. I
22 will just put it back up again as a reminder. That was
23 the regional priorities model that I just referred to
24 there. That model is not a necessary component of
25 habitat supply analysis. It is a component that we

1 utilize and we find helpful. It is not a necessary
2 component. The necessary component, though, is the
3 watershed assessment level and that's what I will spend
4 the rest of the time on now.

5 The management options level, as I
6 mentioned before, is fairly common, common forest
7 practice and is also -- those options are well known,
8 relatively well understood, the stand level
9 interventions.

10 So looking at the watershed assessment
11 alone, at any of these level GIS can be incorporated.
12 At the regional level it doesn't have to be. More of
13 the question at the regional level was, how much of
14 your area is in a certain snow zone. You can actually
15 measure that with your GIS if you have a snow zones map
16 or it is relatively easy to estimate 30 per cent of my
17 area in is a deep snow zone.

18 In the case of the watershed assessment,
19 as you will see in a moment when we go to specific
20 areas, like Mr. Patch has shown in the case of these
21 forest cover maps, the relative size and the shape of
22 the habitat patches changes dramatically in various
23 place across the map sheet.

24 In our case, we would say, particularly
25 because of the spatial heterogeneity in British

1 Columbia, that there are a lot of differences from
2 place to place; some are steep, some are flat, some are
3 rocky, some are high, some are low. Those kinds of
4 components are by far best handled in a GIS and not
5 with some sort of manual method.

6 The other thing you clearly need are the
7 harvest plans. Given an array of GIS data sources, as
8 an example of those sources, the most fundamental one
9 to evaluate the harvest plan is the forest cover map.

10 The second most important one may be,
11 depending on the area, may be topography. In many
12 places in Ontario, though the topography is nowhere
13 near as rugged as British Columbia, it still is valid.
14 Whether the deer winter range is placed in a valley
15 bottom or the side of a hill makes the difference
16 between whether it is a deer winter range or not.

17 In Mr. Patch's presentation there, I
18 believe all the deer winter ranges are adjacent to
19 stream courses. In other words, even in that fairly
20 flat terrain the deer are responding to the topography.

21 Going through the assessment process,
22 which I will explain in detail later on, you get two
23 kinds of outputs besides feeding into the next level of
24 management options.

25 One is an information need. It may be

1 given the uncertainty that exists that with the current
2 data sources you can't actually make a valid judgment.
3 Rather than just using what you have and bullying ahead
4 anyway, you are probably better off to go out there and
5 try and gather those data.

6 One thing that the model can do for you
7 if it has been appropriately applied in the GIS is to
8 identify not, for example, you need to know how much
9 food there is for moose, but to show you that this
10 stand which appears to be a good winter range, it is
11 critically important to know how much food is there
12 because it is only when that food is in that area of
13 that stand that it can be utilized by moose in that area
14 in the winter time.

15 So, in other words, we can use the GIS
16 and the model structure to focus on the gaps in our
17 knowledge and the gaps in our information.

18 The other things that may be absolute,
19 what I would call your management needs, these are
20 things that are not just a lack of data, but
21 potentially a lack of understanding. Some component
22 that we left out of the model that looks like the
23 decision isn't working right but we are not really
24 certain why, and it may be because there is a factor
25 missing from the model.

1 For example, these models do not
2 incorporate space -- or do not incorporate predators
3 spatially within the watershed. That potentially could
4 be an important component or, for example, the amount
5 of the snow in different areas.

6 I mentioned elevation. Coming from
7 British Columbia I have to show one diagram of a
8 mountain. As I said, for moose in Ontario, having
9 worked here and in our world, the principles are
10 exactly the same. Generally in the winter time you
11 don't want to be at the top of the mountain where it is
12 cold and snowy or on the north side of the slope.

13 So what we are able to do is say
14 everything else, but the best habitat being called one,
15 the north aspect on the high elevation is only rated
16 as, in this particular case, we say .05. In other
17 words, you need 20 times as much of this as that in
18 order to contain the same number of moose, provide the
19 same amount of habitat. Obviously, throughout that
20 area there could be a continuum of other ratings.

21 This is a principle that must be applied.
22 You can't just say moose need cover. You must say
23 explicitly and specifically the kinds of cover and be
24 able to relate them to each other. We call that
25 rating.

1 For the sake of convenience we rate
2 everything from zero to one. Later on those ratings
3 can be scaled, but initially everything gets rated
4 between zero and one. It makes it relatively easy to
5 identify for any particular activity whether it is good
6 or bad, you know, regardless of whether we are talking
7 about the stand structure, the tree species, the food.
8 If it is rated .2 you know that's relatively poor. If
9 it is rated 1 it is considered ideal.

10 In this case, there is a wide array of
11 agreement on what the ratings should be. Everyone,
12 expert or not, can agree that spending winter at the
13 top of a mountain is not a good place to be. It's much
14 better to be on the bottom of the mountain in the
15 valley and on the south slope where it is warm and
16 sunny.

17 Some other ratings are a little more
18 difficult, but still by principles that are relatively
19 common knowledge. They aren't confined to experts.

20 This is an example of the kind of changes
21 in the ratings of food and cover as the forest ages
22 going from zero to roughly more than a century.

23 The solid line is the food quality.
24 Essentially after harvest the shrub component which is
25 the main component of food for many ungulates

1 increases. It increases in this particular case to
2 near the optimum level. About the best you can ever
3 get in producing winter forage for moose or deer is a
4 clearcut that contains a large amount of shrubs.

5 As the forest ages, first of all, the
6 canopy starts to close in and those shrubs start to
7 die, the amount of food goes down. That is coincident
8 with the amount of cover increasing. As a crop species
9 grows up they start to provide cover for the animal in
10 the sense of, for example, security cover. As the
11 trees are taller they are less vulnerable to hunting
12 pressure, the hunters can't see them and it also
13 provides cover, security cover from the predators and
14 it also provides cover from snow.

 If the trees are tall enough, a lot of
the snow will end up in the tree canopy and doesn't
fall on the ground.

 So if you go to northern Ontario in the
winter time, went outside and there is half a metre of
snow in the clearcut, you often find areas under the
canopy that contain no snow at all. The snow has
obviously stayed in the canopy or melted before it has
hit the ground.

 These principles, as I said, are generic
to essentially all forest types. There is -- I can't

1 imagine anywhere in world where the general shape of
2 the curves wouldn't apply. As the forest ages, more
3 the biomass, more the ability of that forest land to
4 produce food for animals ends up in the canopy. In the
5 case of ungulates it ends up out of their reach.

6 So basically what we are doing is taking
7 the food for deer or moose and raising it up into the
8 canopy. In this particular case it doesn't become
9 unavailable. It changes from being food to cover.

10 As you see, older forests often have an
11 interesting mix. Potentially the combination of food
12 and cover in these old forests is better than in any
13 other stage along the way. An intermediate forest may
14 be inadequate from both scales.

15 In British Columbia we have a forest
16 ecological classification system. Our is not FEC. It
17 is BDC which stands for biogeoclimatic - that is what
18 the B stands for - ecosystematic classification system,
19 but it is essentially parallel to that classification
20 system in Ontario.

21 So here is an example of those curves I
22 have just showed you before. I have turned them into
23 bar graphs to make it a little easier to see that there
24 is still complexity here, but for each age class.

25 So in the first case, this first set of

1 bars is the early clearcut, 5 to 10 years or zero to 10
2 years. We now over here and and say, some sites are
3 very moist and some sites are very dry, what is the
4 impact of that on providing food for deer. In this
5 particular case, the driest sites and the wettest sites
6 are not the best sites. Some intermediate amount of
7 moisture is a better area in this particular case for
8 producing food for deer.

9 That principle can be applied obviously
10 here throughout all the other age classes. We did not
11 have to rate all sites for all ages and all possible
12 combinations continuously. Simplifying things like
13 this by saying: Well, let's just look at a certain
14 number of categories, and these are not equally spaced
15 categories, it is obvious that as the forest is aging
16 rapidly or the clearcut is aging rapidly, then the food
17 is disappearing. For an ungulate, the early years are
18 important. We have as many categories in the first 25
19 years, more categories in this particular graph, than
20 we do have for the next one or two hundred years.

21 In this particular case, the 80 year old
22 second growth forest is a considerably poor producer of
23 food. The canopy has closed substantially and there is
24 very little food left underneath it. There is very
25 little growth on the ground that can be utilized by

1 moose or deer.

2 So many ways what I have just been
3 telling you is how to keep it simple. There are some
4 potentially difficult relationships there, continuous
5 relationships that varied over space and time. We
6 simplified that by identifying a few critical areas, a
7 few critical categories and only rating those and
8 rating them relatively simplistically.

9 We initially start off by saying high,
10 medium, low and as our knowledge gains we refine that.
11 High, medium, low is better than saying I don't know.

12 The next component is to include
13 interspersation. Ideally an animal will have food and
14 cover in the same place. Many ungulates, many ungulate
15 models find that primarily these two components need to
16 be incorporated and perhaps no others. The animals
17 have to have food and they have to have security cover
18 nearby to utilize that food.

19 The proximity of those two things
20 determinea how good that habitat is. If there is a
21 clearcut that provides a large amount of food, it is
22 completely open, the animals feel vulnerable there and
23 tend not to utilize the food. I think that has been
24 documented previously by the Ministry witnesses.

25 The other component, though, is that

1 neighbour areas may provide cover and this is a
2 fundamental of the moose those guidelines. The stand
3 structure or the patch sizes and the placement of those
4 stands must provide an opportunity for the animals to
5 move between the food producing areas and the cover
6 producing areas. The proximity there, the closeness of
7 those determines the quality of that habitat.

8 The simple principle is, the closer they
9 are the better. If you can provide that in the same
10 stand that would be ideal.

11 In most case the patches that we impose
12 in forestry -- I shouldn't say in most. In some cases
13 the patches that we impose in forestry are larger than
14 those patches that the animals would prefer. In other
15 words, the middle of the clearcut is too far away from
16 the forested edge for the animals to utilize all the
17 food that's produced there. The middle of the forest
18 area is too far away from the clearcut for the animals
19 to go in to use that cover.

20 These principles were identified in the
21 Blue Mountain Handbook that Dr. Thomas tabled earlier
22 dealing with one of the fundamental components of those
23 original elk models.

24 So that's the component of including
25 interspersation. That structure that I just identified

1 there -- I should return to that one. The structure I
2 have identified here is generic to the structure of the
3 model. An animal has to have food and it has to have
4 cover, but not in the same place. We can assess the
5 quality of food, the quality of cover separately and
6 then how close they are to each other and rate that
7 overall value.

8 But in the case of winter range in
9 British Columbia, aspect elevation is what I would call
10 a limiting factor. Regardless how much food or cover
11 you provide for an animal in a deep snow area it can't
12 survive. The snow is so deep the animal will die
13 regardless. So regardless of what you do with that
14 component of the model in terms of food and cover
15 aspect elevation can override you. So this kind of
16 factor is incorporated as to what we call a limiting
17 factor.

18 The best structure can be now
19 incorporated more elaborately. What I just showed you
20 is this upper area here. So this is what we call
21 severe winter habitat. This is conditions in the
22 winter time of deep snow. The animal has to have cover
23 available and food available at all times in relatively
24 good proximity, close to each other.

25 Mild winter habitat would be those

1 conditions when there is much less snow. The snow
2 itself does not not severely limit the animal to be
3 able to move around.

4 Then the most important factor is food
5 alone. The animals can move great distances to find
6 that food and the cover factor is much less important.

7 Similarly, the aspect elevation is not as
8 important. This is labelled No. 12 on mine.

9 MADAM CHAIR: We don't have that one.

10 MR. MARTEL: We have 12, but it is
11 different. It is pie charts.

12 MR. O'LEARY: We neglected to include a
13 copy. We will add one tomorrow.

14 DR. PAGE: As I mentioned, the structure
15 here and here are similar. What we have done in this
16 case we have changed the size of the boxes. What that
17 means is that we have weighted these factors
18 differently in the two components of the model. So we
19 have just said, in adding up the overall quality don't
20 keep the two values equal.

21 It may not seem the same, but actually
22 that structure is also replicated here. The animals
23 may have some severe winter conditions later in the
24 winter, mild winter conditions early. The difference
25 between severe and mild is just determined by snow

1 depth.

2 So early in the year an animal will --
3 and that is the case in Ontario, moose are in more open
4 areas. In December, January moose are in open areas.
5 The Ministry I think undertakes their classification
6 surveys then when they can fly around and see animals
7 from a helicopter. That will be what I will call the
8 mild winter habitat needs.

9 Later on as the winter progresses and the
10 snow deepens the animals move to more cover. In the
11 case of these two models, the quality cover box
12 increases. So these areas must also be close to each
13 other. The animals are going to move from an area that
14 they were to an area that they would have to be in now.
15 So that same structure of evaluating a needed component
16 and another and how those close they are can be done
17 with the model and with the GIS.

18 So by starting with some fairly simple
19 factors like food and cover we keep adding them up in
20 this kind of a structure to end up with a relatively
21 complicated overall winter habitat quality. This
22 winter habitat quality has many potential values that
23 all started from a relatively simple set of original
24 values.

25 I won't even go into it here, but we have

1 taken this same structure now and evaluated summer
2 habitat. Looked at the distances between winter and
3 summer habitat and you can essentially go on and on.

4 An animal may require calving habitat,
5 moose may require closeness to mineral licks. Those
6 factors can be incorporated relatively easily into this
7 structural model.

8 As I said, we have had no difficulty
9 explaining to the public this kind of structure. The
10 concept that animals need food and cover is well
11 understood.

12 Finally, and just because -- not quite
13 finally, but to summarize particularly because it is
14 getting particularly close to the time to quit, the
15 results of this model don't have to be complicated and
16 coloured in maps with an array of ratings.

17 It is relatively easy to summarize the
18 results. Though the application of the model may
19 result in reams and reams of computer printout or very
20 complicated looking and elaborate maps, you can
21 summarize it in simple ways to get the management
22 information across.

23 So here we are in the current year of
24 1990. The best severe winter habitat, which is the
25 solid pie here, occupies up to 7 per cent of the land

1 area. This is now 20 years down the road after the
2 imposition if a series of five-year timber management
3 plans. We have effectively maintained the same amount
4 essentially of that severe winter habitat so that one
5 winter will not come along and kill off the entire deer
6 population.

7 What we are done, though, is increase the
8 amount substantially from 49 to 64 per cent of
9 inadequate habitat. There is even less area out there
10 in total for the deer population. In this particular
11 case the reason is that there is a large area now
12 because of exactly the same kind of age structures as
13 in New Brunswick. There is a large area of middle aged
14 second growth forest, roughly 50 years old, that do not
15 provide either food or cover.

16 This pie chart, as I said, comes from
17 British Columbia. I have no doubt that if the same
18 results, the same summary tables were produced from New
19 Brunswick at some point the pies would be similar.
20 There would be a large area of inadequate habitat for
21 winter range, but potentially enough left just to meet
22 your habitat objectives.

23 The final component is because you are in
24 the GIS you don't have to have a single summary like
25 that. A timber management plan is not applied

1 uniformly across the landscape. There are differences
2 of local areas. In this case, and I will be referring
3 specifically to this area later on, you can subdivide
4 it geographically. If you started it, for example,
5 with a watershed, vis a vis subdrainages, then you find
6 that there may be substantial differences. The
7 majority of your good habitat may be concentrated in
8 one area.

9 Again, you would focus your habitat
10 efforts in a different area. One area may already
11 have, in this case, 21 per cent of the severe habitat
12 maybe in a single...

13 20 per cent severe habitat may be in one
14 area and a little bit more effort may be needed in the
15 other 14 per cent. I have only chosen two of the units
16 out of them all. Some of the units are much worse and
17 I didn't show those here. That's why it was only 6 per
18 cent.

19 The final thing to understand is having
20 evaluated the quality of your habitat and the impacts
21 of timber management plans is to understand how close
22 you are going to be now having made your habitat
23 objectives to your population objectives.

24 Generally we would be willing to say if
25 we are just looking at winter range, looking at that

1 one of piece of the puzzle that determines what the
2 population size is going to be, we would say that all
3 other factors being equal there should be basically
4 one-to-one correspondence between how much habitat we
5 have and how many animals we have.

6 In other words, if we were able to double
7 the habitat, everything else being equal, we would
8 expect to find twice as many animals. We have
9 structured our model to be as close as we are able to
10 make it to that kind of linear scale, that twice as
11 much habitat should provide twice as many animals.

12 In reality there is a wide array of
13 factors in the population that may limit that
14 population and prevent it from occupying all habitat.
15 As an example, predation. Wolves are an effective
16 predator on ungulate, the amount of snow and the
17 differences in that snow from year to year, the amount
18 of hunting pressure which is clearly a factor that
19 managers do have the ability to control.

20 In the case of many populations, though
21 not as importantly for moose, the population is often
22 composed of what we would call different behaviours.
23 In this case, do these populations migrate from one
24 area to another or are they resident there. You manage
25 the populations separately because the migraters can

1 find the habitat whenever you create it.

2 Not to be surprisingly there are always
3 some unknowns including such things as climate change.
4 We are forecasting now 20 or more years into the future
5 with these habitat models. We may not be able to
6 consider that the climate is going to be constant. As
7 I said, these are the factors we have not incorporated
8 into our habitat model. Those are the kinds of factors
9 they may prevent the population from achieving what the
10 habitat model indicates it should.

11 The result of those factors is just
12 because the habitat model and the population size that
13 you see in the real world don't match exactly does not
14 necessarily mean the habitat model has failed. In
15 other words, the best habitat may not have all of the
16 animals in it and it may be because of other factors
17 that you have not incorporated. We will return to this
18 I think when we talk about monitoring.

19 That concludes this particular
20 presentation.

21 MADAM CHAIR: Thank you, Dr. Page.

22 MR. O'LEARY: Judging by the hour and the
23 fact that we are about to move into a scoping session
24 at four o'clock it might be appropriate to call it a
25 day.

1 MADAM CHAIR: That's a good idea, Mr.
2 O'Leary. We will see you tomorrow morning, gentlemen,
3 at nine o'clock.

4 We are going to have a procedural session
5 now. There is no need for you to sit in if you don't
6 want to. You certainly are welcome. Thanks.

7 ---(Panel withdraws)

8 MADAM CHAIR: Mr. O'Leary, Mr. Hanna, we
9 will go through our regular procedure for scoping the
10 upcoming evidence and we are looking at your witness
11 statement for Panel 8 which is entitled The
12 Socio-Economic Techniques and Critical Analysis and we
13 will be hearing from Dr. Victor and Dr. Kubursi.

14 Have you told your witnesses that we have
15 covered some of these topics and issues in the evidence
16 of Forests for Tomorrow in their Panel 4 evidence given
17 by Dr. Payne and in the Panel 7 evidence with respect
18 to the testimony of Drs. Morrison and Muller?

19 The concepts that Dr. Victor and Dr.
20 Kubursi are discussing are familiar to the Board and so
21 in their oral examination they can move along fairly
22 quickly, very quickly actually, but we do have a long
23 list of questions that we would very much like your
24 witnesses to address themselves to.

25 Again, some of this repeats some of the

1 questions we had with respect to Forests for Tomorrow's
2 evidence and other questions are being raised for the
3 first time with these witnesses.

4 First of all, on page 13 Dr. Victor
5 discusses non-timber values and later on he gets into a
6 discussion of existence values. We would like to have
7 Dr. Victor explain for us his statement on page 13
8 that:

9 "Even people who never visit forests but
10 just like to know they are there are
11 beneficiaries of non-timber values."

12 We understand certainly that these are
13 the existence values about which Dr. Victor refers to,
14 but we want to know what kind of benefits do these
15 people receive and can he explain in detail for us how
16 these intrinsic kinds of values can be assessed and
17 particularly given any sort of economic value.

18 We raise this question in connection with
19 that same paragraph where Dr. Victor refers to the fact
20 that some forest recreation activities may have
21 entrance fees; for example, fishing and hunting licence
22 fees, but typically these fees are far below the value
23 participants are willing to pay for these activities.

24 We understand the theoretical evidence
25 which Dr. Victor refers to as does Dr. Kubursi, but as

1 you know the Board has heard of resistance towards
2 probably relatively small payments for fishing licences
3 and camping fees in northern Ontario and this seems to
4 oppose the theory that people would be willing to pay
5 more to either protect or give up such activities and
6 we would like Dr. Victor to address that issue for us.

7 On page 18, Dr. Victor refers to "well
8 established procedures to measure the value of wood
9 fiber production." He refers to these as being
10 available and we notice in the interrogatory responses
11 that he refers to some literature.

12 We want to hear from Dr. Victor very
13 briefly as to how he views the value of wood fiber
14 being established and does he agree with the view that
15 the value of wood fiber production should be measured
16 only by stumpage fees.

17 Dr. Victor refers on this page to the
18 Tongass Forest study by Randall, Hole and Swanson. I
19 don't think we have a copy of that. I don't know how
20 large the study is and I don't know if we are going to
21 have to see it, but we haven't.

22 Beginning on page 21, Dr. Victor
23 discusses measuring non-timber economic values and we
24 have some -- first of all, a general question for Dr.
25 Victor and that question is, does he believe that in an

economic comparison of timber versus non-timber values in the area of the undertaking on a particular management unit for a particular timber management plan that non-timber values can be demonstrated to have equivalent or greater economic value than timber values.

The related question, what is Dr. Victor's response to the position that regardless of the outcome of socio-economic analyses; in other words, no matter how small the economic value that can be placed on a non-timber resource or value, if these are to be protected in timber management planning to what extent should the effort be made to do socio-economic analysis.

I guess we can just jump to page 31 at this point because it is the related issue where Dr. Victor --

MR. FREIDIN: Sorry, what page Madam Chair?

MADAM CHAIR: 31.

MR. FREIDIN: Thank you.

MADAM CHAIR: Dr. Victor appears to oppose constraints to protect non-timber values and he refers to limits to clearcut size, areas of concern and access restrictions as being constraints. It is here

1 that the Board is asking these questions. Is his
2 reason for opposing constraints that he believes
3 socio-economic analyses will indicate that non-timber
4 values are more important than timber and, therefore,
5 should take precedence over the timber industry or
6 should preclude timber management planning, or is he
7 saying, as he seems to be hinting at on page 32, that
8 the results of such socio-economic analyses will arrive
9 at the conclusion of requiring even greater constraints
10 for non-timber values than the existing ones. For
11 example, on page 32 Dr. Victor says:

12 "Optimum levels of protection or
13 enhancement of non-timber values are not
14 explored in a formal rigorous manner."

15 So the Board is confused about what is to
16 be the result of socio-economic analyses as Dr. Victor
17 sees it.

18 Going back to the discussion on pages 21
19 through 24, the Board wants to know what studies have
20 been done that measure non-timber values in the area of
21 the undertaking by any of the procedures listed by and
22 discussed by Dr. Victor in these pages.

23 We certainly have read the reference to
24 the Haliburton/Muskoka acid rain study, its impacts on
25 sports fishing, and we also notice with great interest

1 on page 9 of the interrogatory responses the statement
2 that:

3 "There exists a large number of surveys
4 undertaken by the Ministries of Natural
5 Resources and Tourism as well as NOTO
6 that provide measures of hunting
7 quality."

8 As well on page 12 of the interrogatory
9 responses where Dr. Victor has identified models that
10 are used by the Ministry of Natural Resources and
11 Tourism and Recreation, and we want to know whether
12 there exists some large body of research on evaluating
13 non-timber resource that this Board hasn't heard about.

14 We don't understand what that means. We
15 have, of course, received bits and pieces of studies,
16 but nothing very recent and we want to ensure that we
17 have seen everything there is with respect to research
18 that's been undertaken in northern Ontario and what
19 this research has to say about evaluating non-timber
20 resources and values.

21 On pages 33 to 35, Dr. Victor describes
22 estimating the economic value of alternate access
23 networks for an FMU and we want Dr. Victor to elaborate
24 on his answer as to how the impacts of forest access
25 roads on remote tourism operations can be assessed and

1 we want to know what the outcomes are of such an
2 assessment.

3 So the first part of the question is,
4 what is Dr. Victor telling us about how to estimate the
5 economic value of road access and alternate access
6 networks; and secondly, we want to know what kind of a
7 conclusion you would get out of such an analysis.

8 Would you, for example, conclude from
9 such an assessment that the remote tourist operation
10 would be put out of a business if a road went in such a
11 location, or would you conclude that the business of
12 the tourist operator would decrease by so many dollars
13 if a road were put in such a location.

14 On page 35, the Board is going to admit
15 it is completely mystified by the Schaeffer 1991 study
16 on old growth conservation strategies in British
17 Columbia. We have read this study carefully because we
18 are very interested in seeing how you assess non-timber
19 values and so far as we can see in the Schaeffer study
20 they are able to assign and assess economic values for
21 wood and tourism and commercial fisheries and domestic
22 hunting and fishing and government revenues and
23 employment, but when it comes to what they describe as
24 the ecological and aesthetic values they don't measure
25 them. They discuss them, they say kind of obvious

1 things about what will happen to values such as these,
2 but they don't measure them in any way and we thought
3 when we read the witness statement that Dr. Victor was
4 telling us you can do that.

5 They sure don't do that in that study and
6 we want to know if there is some study where they do
7 that. So far as we can see these terribly difficult,
8 terribly important and difficult values we just can't
9 see them measured anywhere. Now, they are accounted
10 for because people admit that a concept such as
11 biodiversity or old growth forest has some importance,
12 but it is not clear to us how that fits into any kind
13 of a socio-economic analysis.

14 Also on page 35, Dr. Victor makes the
15 statement that:

16 "The results of such an analysis should
17 be presented to the public to obtain
18 their views as to the best course of
19 action."

20 We would be interested in having Dr.
21 Victor describe for the Board any such public
22 participation exercises that he has observed or been
23 involved in with getting the public to discuss or make
24 a decision about which alternatives should be selected.

25 We have a few questions for Dr. Kubursi.

1 On pages 41 and 42, Dr. Kubursi refers again to
2 economic concepts and economic theory and we wish to
3 know whether Dr. Kubursi believes that job losses
4 reflect short-term adjustments with respect to forest
5 products -- the forest products industry employment in
6 northern Ontario. This is matter we had discussed at
7 some length with Drs. Muller and Morrison in Forests
8 for Tomorrow's case.

9 Of very great interest to the Board is on
10 page 45. Is Dr. Kubursi's -- well, he discusses this
11 over a number of pages, but we wish him to provide to
12 the Board a fairly detailed summary of the results of
13 the economic -- the studies on economic impact of the
14 remote tourism industry in north Algoma and also the
15 1985 Ministry of Tourism and Recreation report that's
16 listed behind the same tab which is Tab 6.

17 The Board has stated many times during
18 this hearing that we have very little evidence in front
19 of us on how the tourism industry works in northern
20 Ontario. We have been waiting to here NOTO's evidence
21 on how the tourism industry and particularly the remote
22 tourism industry works in northern Ontario and
23 certainly how it has been or will be affected by timber
24 management.

25 So we would like you to encourage Dr.

1 Kubursi to really give the Board an update on the best
2 statistical information that's available on tourism in
3 the area of the undertaking. For all we know there may
4 be more studies than those listed behind Tab 6 and we
5 would like to see the most recent studies that exist.

6 I believe we asked the Ministry of
7 Natural Resources for this in their reply evidence, but
8 I would think that the Coalition would want to put
9 their views of what these statistics mean before the
10 Board themselves.

11 Also, we would like to know, does anybody
12 know how many foreign visitors go to northern Ontario
13 annually. We don't even have in front of us anything
14 as straightforward as that seems to be.

15 MR. FREIDIN: Can people from southern
16 Ontario be referred to as foreigners?

17 MR. O'LEARY: It depends where you are
18 born.

19 MADAM CHAIR: Yes, I bet they do, Mr.
20 Freidin.

21 On page 48, Dr. Victor refers to the
22 types of predictions in terms of changes in recreation,
23 timber and tourism values that are routinely estimated
24 in timber management plans prepared in the United
25 States. We would like Dr. Victor to put before us an

1 example of where such predictions are made routinely in
2 U.S. Forest Service management plans.

3 On page 50, Dr. Victor refers to a figure
4 of 60 per cent recycled fiber content for pulp and
5 paper production. We are not clear where that 60 per
6 cent came from.

7 That's not from your terms and
8 conditions, is it?

9 MR. HANNA: (nodding affirmatively)

10 MADAM CHAIR: That is from your terms and
11 conditions.

12 We would like Dr. Victor to address
13 then -- this is in contradiction to Mr. Dunkinson's
14 evidence for the Ministry of Natural Resources where
15 the evidence we have before us is that the maximum
16 achievable recycled figure you would get would be 50
17 per cent and this is only being done in Japan,
18 according to Mr. Dunkinson, and that the figure is
19 considerably smaller in Ontario. His evidence before
20 us seems to be that that's not -- anything higher than
21 that is not very achievable in the foreseeable future.

22 The associated question is, is in
23 achieving anything higher or achieving a 60 per cent
24 recycled fiber content what does that mean to the
25 forest products industry.

1 On page 51, we are very interested in
2 having Dr. Victor elaborate on his view that stumpage
3 fees should be used to address the issue of wood
4 wasteage.

5 Those are the questions that the Board
6 has.

7 There would be one final question and
8 that is - it is a difficult question but we would put
9 it to Dr. Victor and Dr. Kubursi - the time frame and
10 the resources they think would be required to do the
11 kinds of socio-economic analyses that they are
12 proposing for timber and non-timber values in all
13 management units for all timber management plans.

14 We would ask about the proposal made by
15 Dr. Victor that some expertise, and I think he is
16 talking about economists or other kind of experts in
17 socio-economic analysis, would be required.

18 We notice that the only reference point
19 we have about how large a project that might be or the
20 cost of such a project would be the Haliburton/Muskoka
21 sport fishing study where we notice that it required
22 four months at a cost of \$45,000 to obtain data and
23 arrive at some conclusions.

24 MR. O'LEARY: Madam Chair, could we just
25 have clarification on one of your questions and that's

1 in reference to Dr. Victor's evidence at page 21 and
2 your question about the comparison between timber and
3 non-timber values. Could you just repeat that for us?

4 We seemed to have both gotten a little
5 lost there. This is the first one -- well, both.
6 There are two questions. One was more general it
7 appeared than the other.

8 MADAM CHAIR: The questions with respect
9 to comparing timber and non-timber values--

10 MR. O'LEARY: Yes.

11 MADAM CHAIR: --or the one about any
12 studies that have been done in the area of the
13 undertaking?

14 MR. O'LEARY: No, it's the former.

15 MADAM CHAIR: All right. What we are
16 asking there was, and that related as well to page
17 31 -- is that the point you were talking about?

18 MR. O'LEARY: Yes, you followed it by the
19 page 31 reference.

20 MADAM CHAIR: We were asking whether Dr.
21 Victor believes that in an economic comparison of
22 timber versus non-timber values on a particular
23 management unit for a particular timber management plan
24 that the economic value for the non-timber resource
25 will be demonstrated to have equivalent or greater

1 economic value than that of the timber resource.

2 We go on to ask that because we want Dr.
3 Victor to respond to the position that regardless of
4 the outcome of socio-economic analyses -- how does he
5 respond if there is a commitment to protect non-timber
6 resources regardless of whether their economic value is
7 less than or equivalent to or greater than timber
8 values. We want to know how he responds to that
9 argument. Should investment be made in doing that kind
10 of analyses if you are going to commit to protect those
11 non-timber values in any event.

12 That related to his point on page 31 and
13 the point on page 31, he seems to be opposed to
14 protecting non-timber values by constraints and we
15 wanted to know in that case does he believe that the
16 socio-economic analyses will indicate that non-timber
17 value are more important than timber, or would the
18 results of such analyses indicate that non-timber
19 values require greater protection and we took it from
20 his quote on page 32 that that might be what he is
21 getting at and on page 32 Dr. Victor says:

22 "Optimum levels of protection or
23 enhancement of non-timber values are not
24 explored in a formal rigorous manner."

25 MR. O'LEARY: I think we understand the

1 question now.

2 MADAM CHAIR: Ms. Callaghan said that she
3 would be able to speed up the transcript on the scoping
4 session. So that might assist you in addition to your
5 notes.

6 MR. O'LEARY: That would be appreciated,
7 but we will make best efforts prior to that.

8 MADAM CHAIR: We don't necessarily spend
9 this much time putting the Board questions to you.

10 Do you have any questions for the
11 parties, Mr. O'Leary.

12 MR. O'LEARY: We have reviewed the
13 various list of issues that have been filed and we
14 don't have any concerns or questions.

15 MADAM CHAIR: We will be -- you won't be
16 cross-examining, Ms. Gillespie?

17 MS. GILLESPIE: We don't want plan to
18 unless something comes up during the oral evidence.

19 MADAM CHAIR: And you don't have any
20 problems with the fact that Dr. Victor is an employee
21 of the Ministry of the Environment?

22 MS. GILLESPIE: Well, that is something
23 that Mr. Barum just asked me about and I will have to
24 get instructions. I don't know what the position is on
25 that. I assume we don't.

1 MADAM CHAIR: We have a letter from Mr.
2 O'Leary where it seems that everything has been ironed
3 out with respect to Dr. Victor's participation.

4 MR. O'LEARY: I understand that it has
5 been completely copacetic in talking with your
6 colleague.

7 MS. GILLESPIE: I assume so.

8 MADAM CHAIR: So we won't expect any
9 objections to be raised with respect to --

10 MR. O'LEARY: I have dealt with Ms.
11 Seaborn about the matter.

12 MADAM CHAIR: Okay. So that is taken
13 care of.

14 MR. FREIDIN: We will treat him just like
15 any other witness.

16 MADAM CHAIR: Don't say that, Mr.
17 Freidin, or he won't come.

18 So we will be having cross-examination
19 from the Ministry.

20 Is Mr. Cassidy cross-examining?

21 MR. PASCOE: No, he is not.

22 MADAM CHAIR: Mr. Lindgren, you will be
23 cross-examining?

24 MR. LINDGREN: Ms. Swenarchuk will be
25 cross-examining and she advises that she will be

1 approximately one hour.

2 MADAM CHAIR: All right.

3 Mr. Freidin, how long will you be?

4 MR. FREIDIN: Well, I would like to drag
5 it out because the phrase Dr. Victor has a nice ring to
6 it. I don't think I will be more than half a day. In
7 fact, I will be less if all the questions that the
8 Board has posed are answered and I assume they will be.

9 One thing I would like to rise, though,
10 arising out of your request that Dr. Kubursi perhaps
11 deal in more detail with the remote tourism industry in
12 northern Ontario and just ask that if in fact he is
13 going to be relying on documentation which has not been
14 provided as part of the witness statement, be it by way
15 of graphs or studies, that we be provided with as much
16 advance notice as possible and perhaps with copies of
17 that just so we can follow along and prepare.

18 MADAM CHAIR: It may be that Dr. Kubursi
19 will not wish to refer to anything other than the two
20 studies that he has behind Tab 6, but the Board -- even
21 if that is the case, the Board wants some detailed
22 discussion of what these two studies mean and what Dr.
23 Kubursi concludes from these.

24 How long will you be in
25 examination-in-chief, Mr. O'Leary?

1 MR. O'LEARY: We will probably slip into
2 the second day.

3 MADAM CHAIR: Well, certainly we will be
4 finished that week of next week.

5 Are there any other questions?

6 Mr. Pascoe?

7 MR. PASCOE: We are currently scheduled
8 to scope the 9th panel on Wednesday the 26th. If we are
9 done by possibly the Tuesday we may consider scoping
10 the 9th panel on the 25th, the Tuesday instead.

11 MADAM CHAIR: That's all right with the
12 Board. How about the parties?

13 MR. O'LEARY: That's fine.

14 MADAM CHAIR: Let's change that scoping
15 session then to February the 25th and, Mr. Pascoe, you
16 will left the other parties know--

17 MR. PASCOE: Certainly.

18 MADAM CHAIR: --of the change. Thank
19 you.

20 All right. We will see you at nine
21 o'clock tomorrow morning.

22 ---Whereupon the hearing was adjourned at 4:35 p.m., to
23 be reconvened Tuesday, February 18, 1992 commencing
24 at 9:00 a.m.

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